WESTERN GAS

anuary
1926

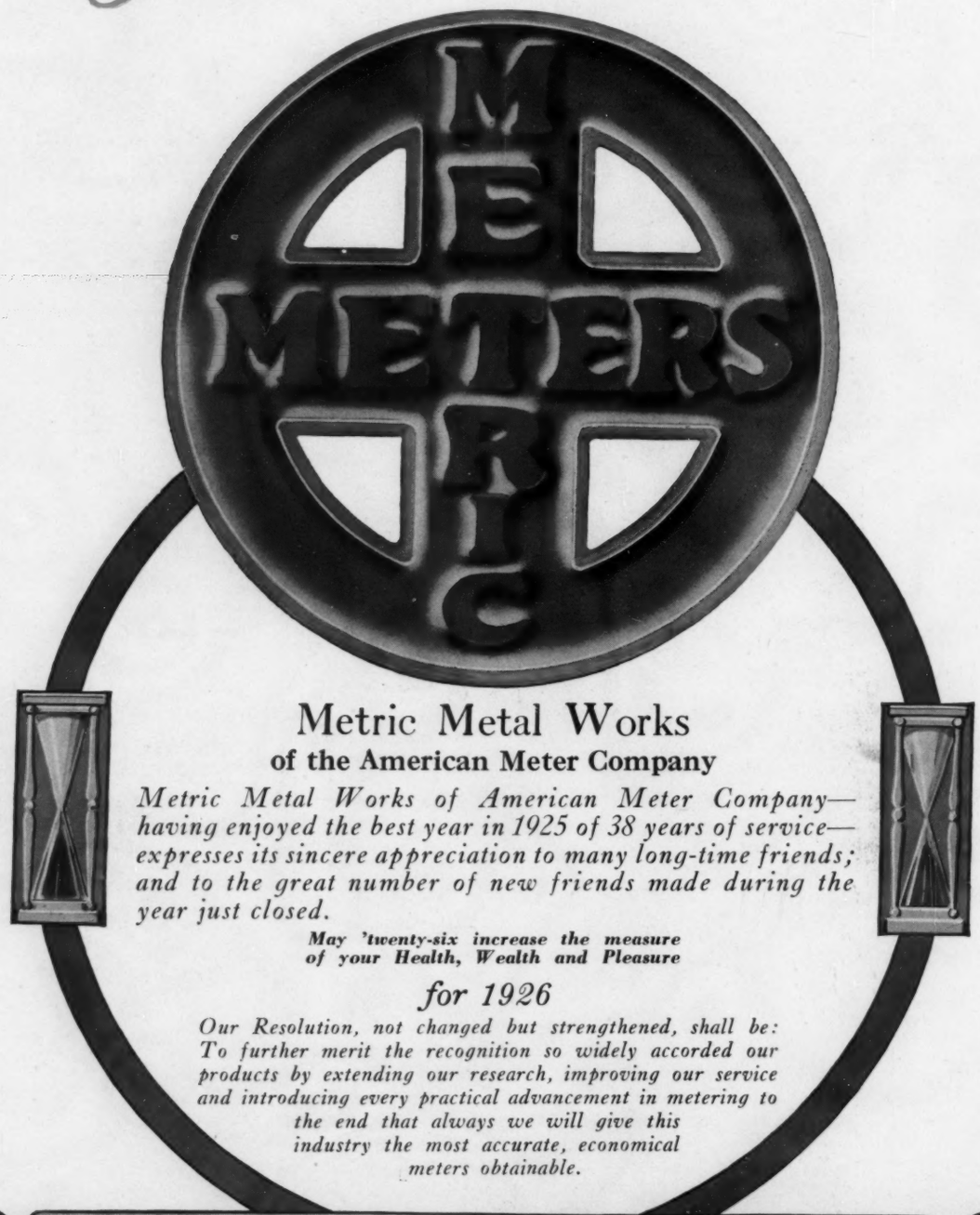
20 Cents
the Copy

The Los Angeles Biltmore—a completely gas-equipped hotel. Members of the Association of Natural Gasoline Manufacturers hold session here during A. P. I. convention, January 19-21

LIBRARY OF CONGRESS
PERIODICAL DIVISION
JAN
1926

A MONTHLY JOURNAL DEVOTED TO THE
WESTERN GAS & APPLIANCE INDUSTRIES

New Year's Measurements



Metric Metal Works
of the American Meter Company

Metric Metal Works of American Meter Company—having enjoyed the best year in 1925 of 38 years of service—expresses its sincere appreciation to many long-time friends; and to the great number of new friends made during the year just closed.

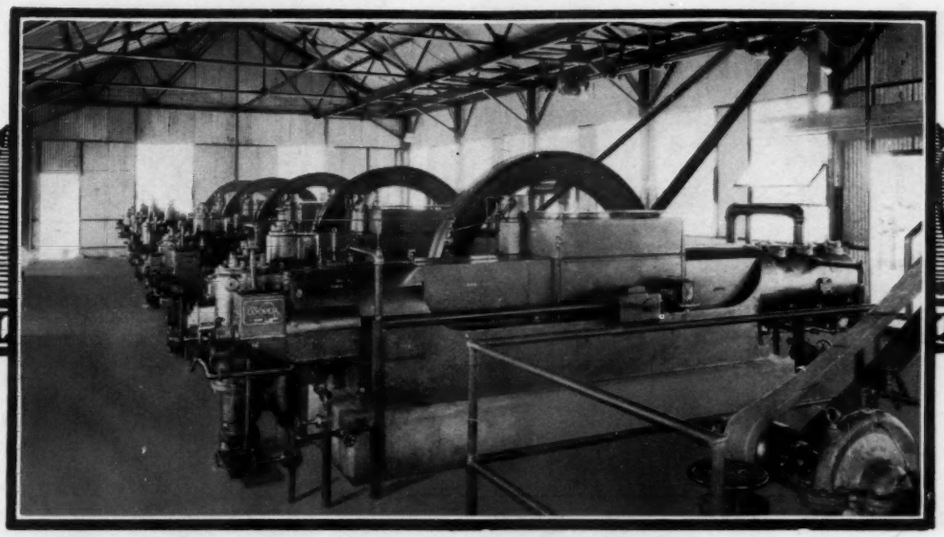
May 'twenty-six increase the measure of your Health, Wealth and Pleasure

for 1926

Our Resolution, not changed but strengthened, shall be: To further merit the recognition so widely accorded our products by extending our research, improving our service and introducing every practical advancement in metering to the end that always we will give this industry the most accurate, economical meters obtainable.

Make this your Metric Meter Year

METRIC METAL WORKS
OF THE AMERICAN METER COMPANY INC



Your *Head* or your *Heart*—which do you use when you buy a Gas Engine?

One type of buyer asks how much fuel does a Cooper engine use? How many cubic feet of gas will it pump? What is the lubricating oil consumption? What is the yearly repair cost? What percentage of operating hours do you get? How long does it take to adjust a crank pin box?

He is the type of buyer who has specified Cooper engines and compressors for years because Cooper engines were originally designed to surpass when measured with such standards.
The other type of buyer asks can Fred Thomas or Fletch Devin from Mt. Vernon; Fred Hudgins from Tulsa; Art Burrell from Dallas; or Jim Reed from Los Angeles come over tomorrow? I want to talk about some gas engines and compressors.

He buys Cooper engines because he knows the man he buys them from and holds in high regard every statement and every promise made by a Cooper representative.

Cooper engines are satisfying men of both types in every oil and gas field of the country.

The Amerada Petroleum Company have installed two more Coopers shown in the plant above.

THE C. & G. COOPER CO.

MT. VERNON, OHIO

1605 Kirby Bldg., Dallas—504 Kennedy Bldg., Tulsa
317 Bank of Italy Bldg., Los Angeles

WESTERN GAS

626 S. Spring Street,
Phone TUcker 8982
Los Angeles, Calif.

447 Sutter Street
Phone GArfield 2772
San Francisco, Calif.

Official Publication Of The
Pacific Coast Gas Association

Contents for January

The Los Angeles Biltmore—Convention Headquarters for American Petroleum Institute and Association of Natural Gasoline Manufacturers.....Cover

The West Plays Host to Petroleum Institute and Natural Gasoline Manufacturers 15

Carbon Monoxide Poisoning Investigations in Los Angeles Covered in Report..... 16
Introduction by Harry L. Masser

Gas Is the Logical Fuel for Heating Large Buildings 18
By Harry L. Warren

Natural Gasoline Engineers Organize for Research 21
By George H. Finley

Pacific Coast Gas Association..... 22

Editorial 24

Testimony of Natural Gasoline Operators Shows Growth of Industry in Past Year.... 25

Increasing Load Cuts Service Charges for Salt Lake City Gas Users..... 27
By Geo. R. Horning

A Window Display for Radiant Types and Water Heaters 28

Glendale Firm Gives Dinner for Poor as Demonstration Feature 29

First Session of Gas Appliance Course Will Convene January 12..... 30

Using Art to Boost Sales—Original Oil Paintings Exhibited 31

Gas Appliance Society..... 32

P. G. and E. Acquires Sacramento Company 32

Natural Gas Gasoline Operations..... 33

California and Wyoming Natural Gas Gasoline Plants Listed..... 33

Naval Yard Equipped for Gas..... 38

San Joaquin Companies Change Hands..... 38

This Month's Patents Pertaining to the Industry 39

Editorial Advisory Board

C. B. Babcock
President, C. B. Babcock Co., San Francisco, Calif.

H. R. Basford
President, H. R. Basford Co., San Francisco, Calif.

Harry J. Bauer
President and General Manager, Pacific Gasoline Co., Los Angeles, Calif.

Louis J. Breuner
Manager, John Breuner Company, Oakland, Calif.

O. C. Bunster
Sterling Furniture Company, San Francisco, Calif.

H. M. Crawford
Sales Manager, Pacific Gas & Electric Co., San Francisco, Calif.

A. B. Day
Vice-President and General Manager, Los Angeles Gas & Electric Corp., Los Angeles, Calif.

E. L. Hall
General Superintendent, Portland Gas & Coke Co., Portland, Ore.

H. W. Jackson
Vice-President, Jas. Graham Mfg. Co., San Francisco, Calif.

Clifford Johnstone
Executive Secretary, Pacific Coast Gas Association, San Francisco, Calif.

Wm. Kapus
President, Northwest Gas & Electric Equipment Co., Portland, Ore.

L. M. Klauber
General Superintendent, San Diego Consolidated Gas & Electric Co., San Diego, Calif.

R. G. Logue
President and General Manager, Beacon Light Co., Los Angeles, Calif.

Wm. Moeller, Jr.
General Manager, Midway Gas Co., Los Angeles, Calif.

Geo. Wehrle
Gas Superintendent, Public Service Co. of Colorado, Denver, Colo.

Geo. E. Whitwell
Byllesby Engineering and Management Corporation.

JAMES E. JENKINS, *Editor* — GEORGE H. FINLEY, *Managing Editor* — H. ELLIOTT TAYLOR, *Associate Editor* — JAY E. JENKINS, *Business Manager*

Volume I **January, 1926** **Number 9**

Western Gas is published monthly at 626 South Spring St., Los Angeles, California, by Jay E. Jenkins. Subscription price (in advance) 20 cents the copy; $2.00 per year; 3 years $5.00; $3.00 per year foreign. Entered as second-class matter June 1, 1925, at the postoffice at Los Angeles, California, under the Act of March 3, 1879.

Copyright, 1925, by Jay E. Jenkins, Publisher.

Western Gas *is fully protected by copyright, and nothing that appears in it may be reprinted either wholly or in part without permission.*

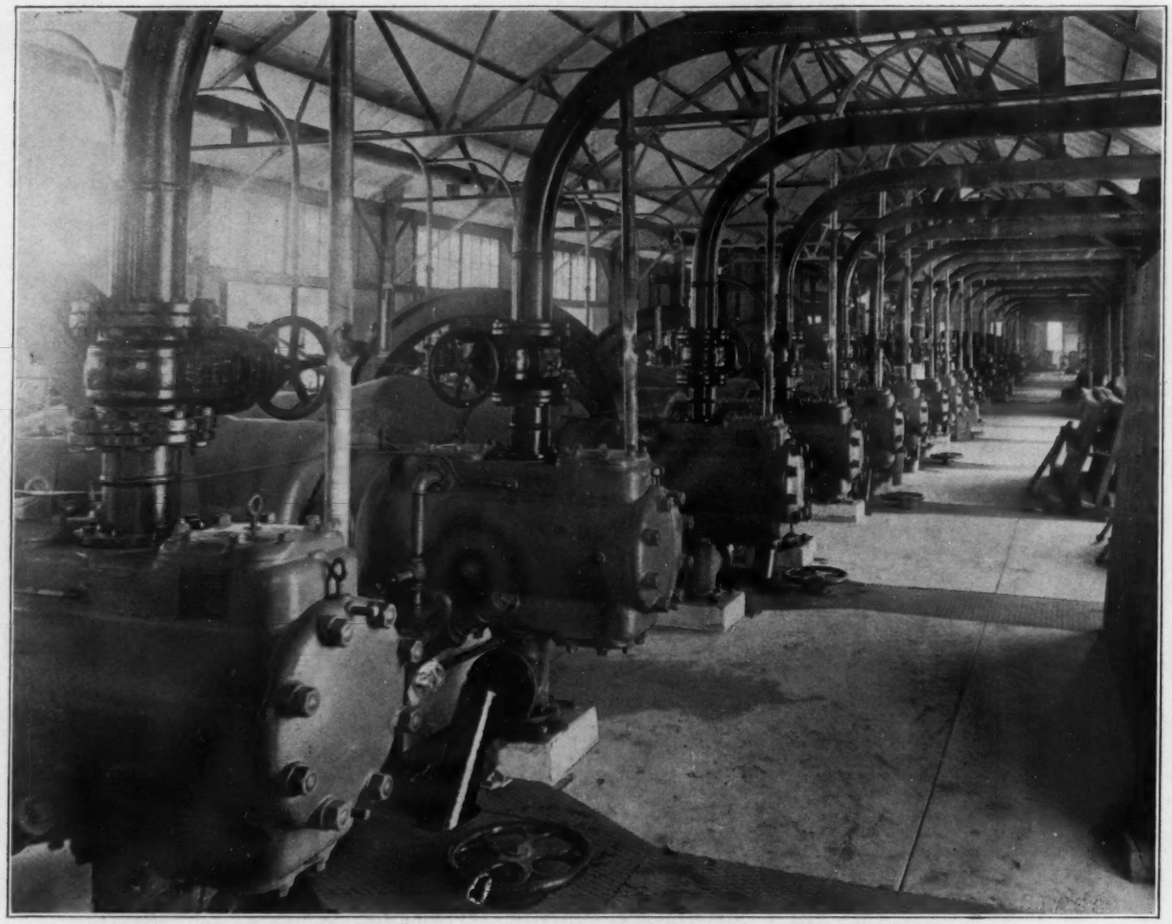
Welcome A.P.I.

Los Angeles, center of the Petroleum Industry in the far West, extends cordial greetings to those who come as delegates of the American Petroleum Institute to their Sixth Annual Convention, January 19-21, 1926, and to the visiting members of the Natural Gasoline Manufacturers' Association.

We of C. F. Braun & Co. heartily join Los Angeles as a whole in welcoming you. Should you find it convenient to visit our plant at Alhambra, a suburb of Los Angeles, we will make every effort to make the occasion pleasant and profitable to you. Braun headquarters during the convention, located in the Biltmore Hotel, are entirely at your disposal, and we sincerely trust that you will feel free to make them also your headquarters.

C.F.Braun & Co.

Manufacturing Mechanical Engineers
Main Office and Factory — Alhambra, California
Mid-Continent District Office — Tulsa, Oklahoma



Ventura Compressor Station of Southern Counties Gas Co.
19 Clark Engines

CLARKS

Clark Direct Driven Compressors were installed in this plant many years ago when VENTURA field was small. Today these sturdy old 80 HP are still on the job, but supplemented by thirteen 175 HP 4-cycle Clarks and three 60 HP belted Clarks, which operate eight-inch Goulds pumps for cooling water.

2-cycle
4-cycle
Direct Driven
Belted

SMITH BOOTH USHER CO.

CONSTRUCTION
ELECTRIC
GAS COMPRESSION
INDUSTRIAL
METAL WORKING
MINING
OIL FIELD
PUMPING
ROADMAKING
TRANSMISSION
WOOD WORKING

MACHINERY
PIPE - VALVES - SUPPLIES

SAN FRANCISCO
50 FREMONT STREET
SUTTER 952

LOS ANGELES
228 CENTRAL AVENUE
TRINITY 6911

60 HP
to
190 HP

. . . a word of greeting . . .

UNDER the varied banners of Petroleum, delegates are arriving in Los Angeles from all points of the compass for the Sixth Annual A. P. I. Convention and the meeting of the Natural Gasoline Manufacturers' Association. On a common platform of bettering the Industry, men from every oil center meet to discuss mutual problems, talk shop, exchange oilfields gossip.

We all have a genuine desire to get acquainted, not merely for selfish reasons, but more especially to further the ideals upon which is founded the American Petroleum Institute.

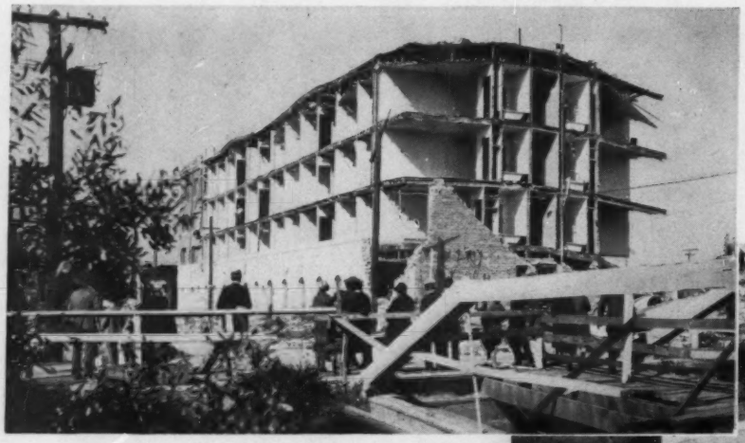
. . . . . In such a spirit do we of Westcott & Greis join in the hearty welcome which Los Angeles extends to the visitors.

WESTCOTT & GREIS

MEASUREMENT AND CONTROL

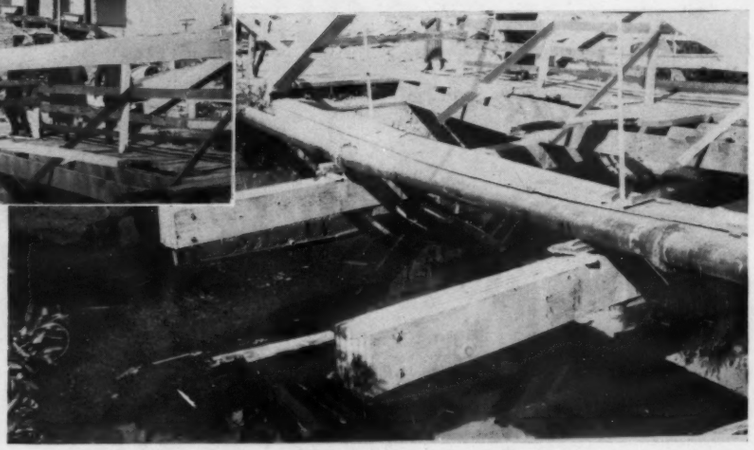
1945 Santa Fe Avenue VAndike 0543 Los Angeles, California

BUILDINGS IN RUINS..... CAST IRON PIPE INTACT



"It is interesting to note that cast iron pipe was not injured in the least by the earthquake."

—From a report by Clyde H. Potter, Southern Counties Gas Company, writing on the effect of the Santa Barbara shock on the gas mains of the city.



Following the quake that rocked the city of Santa Barbara, engineers were prepared to find both gas and water distribution systems at least partially wrecked, but here is what investigation disclosed:

Of over 50 breaks in the gas mains, not one was in the cast iron pipe lines.

There were but two breaks in the cast iron water mains—both minor in nature and easily repaired in a short time.

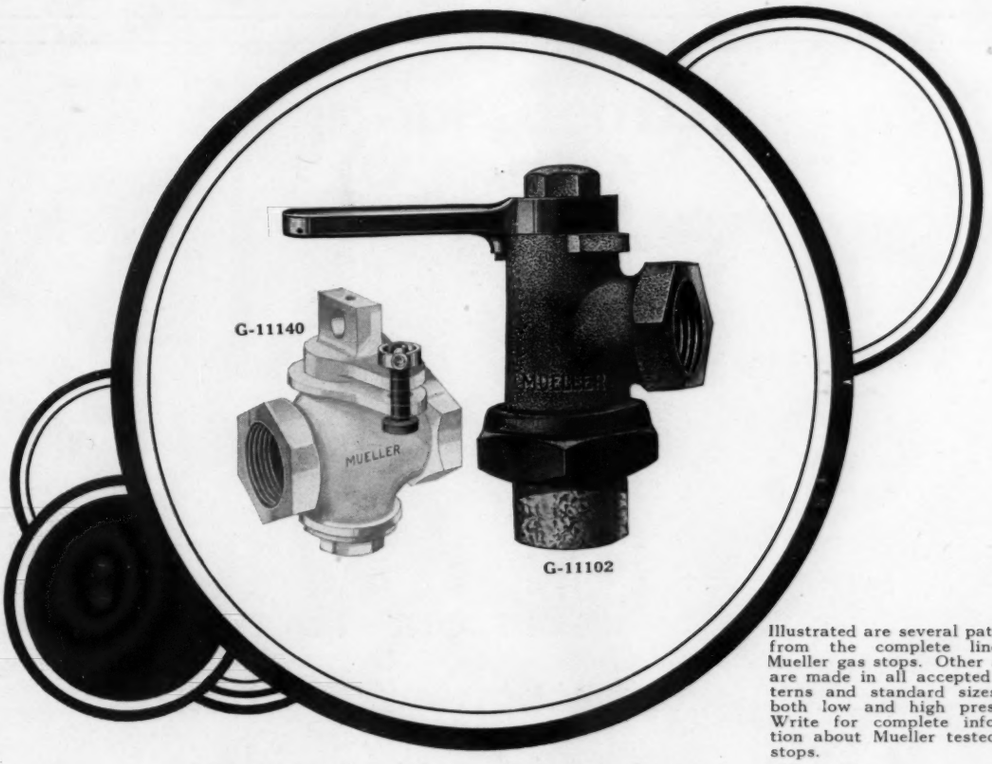
Even under extreme conditions—

CAST IRON PIPE IS PERMANENT CONSTRUCTION

⁂ ⁂ ⁂

United States Cast Iron Pipe and Foundry Company

Los Angeles **San Francisco** **Seattle**



Illustrated are several patterns from the complete line of Mueller gas stops. Other stops are made in all accepted patterns and standard sizes for both low and high pressure. Write for complete information about Mueller tested gas stops.

The difference that 69 years make in these gas stops

In 69 years styles in almost every commodity on today's market have changed a good deal—but one thing hasn't changed—*quality*. Back in 1857 when Hieronymus Mueller first began the manufacture of brass products, gas stops were simply gas stops, and there was not much of a pedigree to back up any of them. But he was convinced that gas stops, to do their work properly, must be made of quality materials with good quality workmanship. And this principle has been carried down through three generations.

Today, Muller gas service stops have an unbeaten performance record behind them. Years of experience have improved them—but Mueller construction has needed no change in quality—has permitted no change from the original standards laid down by the founder. That is why leading gas companies that have installed Muellers gas stops insist on Muellers every time.

If you want *first* cost of gas service stops to be *final* cost, you too will want to install Muellers. Let us send you complete information about Mueller gas stops, and the full Mueller line of gas service industries.

MUELLER CO.

(Established 1857)

Factories: Decatur, Illinois; Port Huron, Michigan

Canadian Factory
MUELLER, Limited, Sarnia

Branches
New York, San Francisco, Los Angeles

MUELLER

To our 108,000 consumers throughout Southern California and to our friends in the Gas Fraternity of the West, the Officers, Directors and Employees of this company extend their sincere wishes for

Nineteen Twenty-Six

Southern Counties Gas Company

Los Angeles, California

Every Phase of Trench and Pipe Work is Speeded Up

CUTTING through pavement or hard ground; breaking up hardpan, clay, or boulders; picking and removing earth; laying, calking, and tapping pipes; backfilling and tamping—these and many other jobs are done better, quicker, and cheaper with an I-R Portable Air Compressor and Tools.

I-R Machines make it possible to calk a joint in one-half the time required by hand. There are I-R Tools for every class of work. Similar savings can be made on each of them. Descriptions of these tools and comparative cost figures will be gladly supplied.

INGERSOLL-RAND COMPANY
11 BROADWAY, NEW YORK CITY

Offices in principal cities the world over
LOS ANGELES—108 West Second St.
SAN FRANCISCO—Rialto Bldg.
EL PASO—618 Mills Bldg.
SEATTLE—526 First Ave., South
SALT LAKE CITY—51 W. S. Temple
DENVER—Stearns-Roger Mfg. Co., 1718 Calif. St.

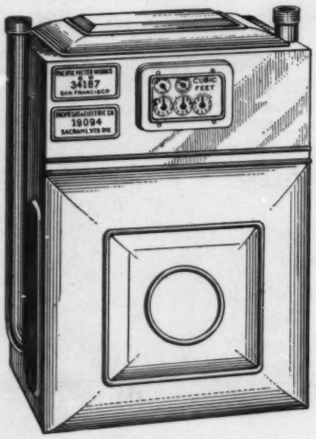
Ingersoll-Rand

57-PC

Pacific Meter Works

OF

AMERICAN METER COMPANY
INCORPORATED

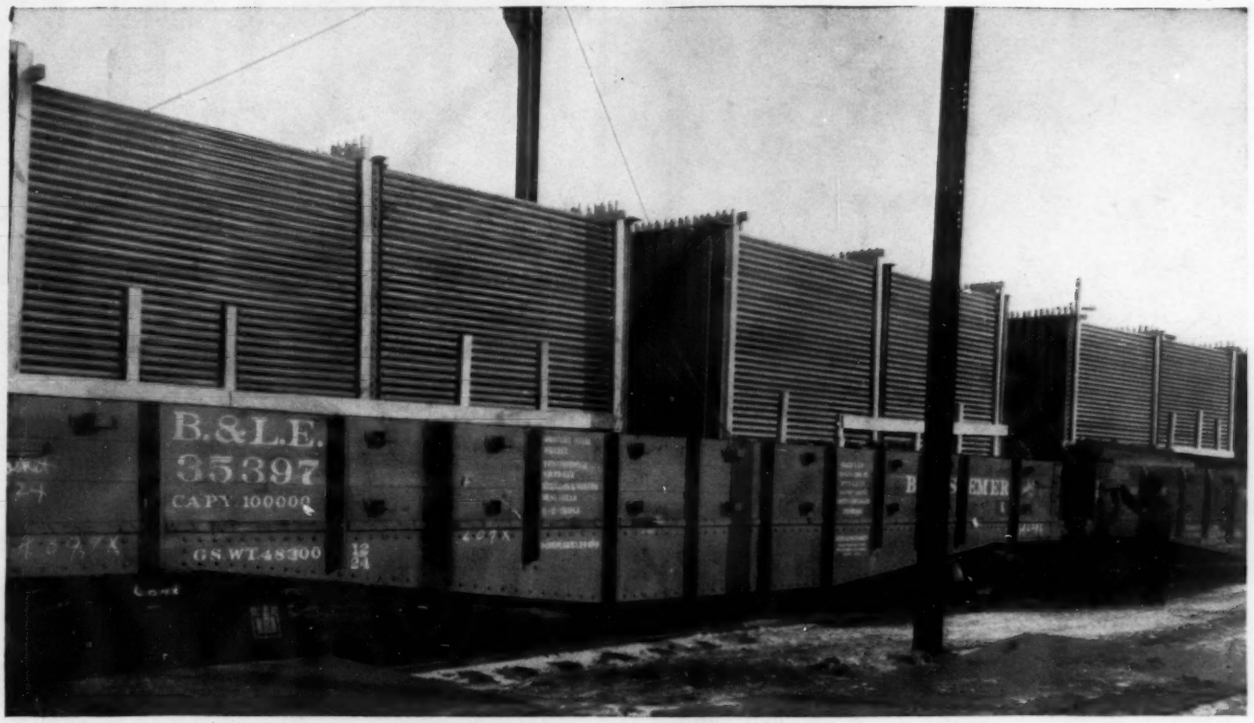


GAS METERS
AND
GAS TESTING
APPARATUS

1123 HARRISON ST.
SAN FRANCISCO

2118 ATLANTIC ST
LOS ANGELES

Steere Cooling Coils



52 Stacks of Steere Sherardized Cooling Coils, each 40 tubes high, ready to leave our Shops for the Hudson Valley Coke & Products Corporation, Troy, N.Y.

Every feature has been incorporated to make the Steere Sherardized Cooling Coil the most practical from the standpoint of the operator.

Our method of expanding 2" boiler tubing into arc welded steel headers saves the full thickness of the wall of the tube. No threading required.

The inside of every tube is readily accessible—simply remove the plug opposite each end.

Any tube can be replaced without dismantling the stack.

The close spacing of the tubes reduces the water loss through splashing to a minimum.

High cooling water efficiency is assured by distributing troughs equipped with leveling screws.

Completely electro-sherardized—the most practical insurance against corrosion.

Steere Cooling Coils are shipped completely assembled ready to be set upon the foundation—furnished either Sherardized or black.

We Know We Can Save You Money

STEERE
ENGINEERING CO.
DETROIT, MICHIGAN

Getting best service From the GAS

Use of COPPER boilers and BRASS pipe in water-heating apparatus assures maximum heating service from the gas.

That means satisfactory hot-water supply, pleased customers and greater sales of gas for water-heating.

The hot-water installations are also long-lived because COPPER and BRASS do not rust.

COPPER & BRASS
RESEARCH ASSOCIATION
25 Broadway - New York

METERS

FOR

Natural — Manufactured and all kinds of

GAS

Westinghouse Positive Fluid Gas Meter. An all-metal meter for either HIGH or LOW Pressure, Manufactured or Natural Gas.

Specially adapted to Commercial or Industrial Services.

Ironclad Cast Iron Dry Gas Meter—for Domestic and small Industrial or Commercial Services, either Natural or Manufactured Gas.

Prices and Complete Information gladly furnished on request to office nearest you.

Pittsburgh Meter Company

7800 Susquehanna St., Pittsburgh, Pa.

New York—50 Church St.
Chicago—5 So. Wabash Ave.
Kansas City—Mutual Bldg.
Columbia, S. C.—1433 Main St.
Seattle—4038 Arcade Bldg.
Los Angeles—Union Bk. Bldg.

J. H. HILL, Representative
Union Bank Bldg.—Telephone VAndike 7114
Los Angeles, Calif.

The Question of

Lampblack Dewatering

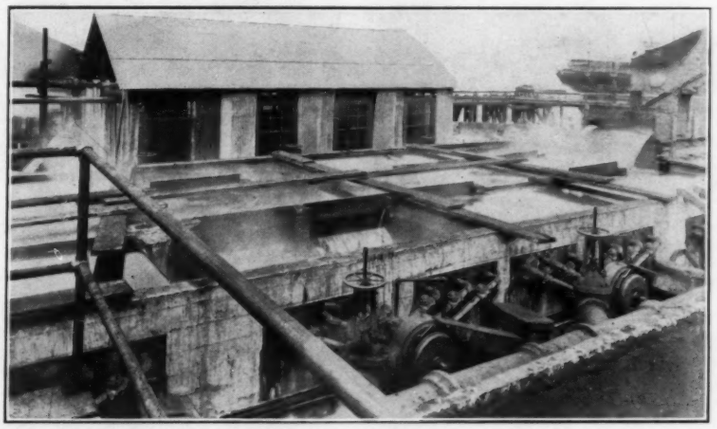
is a very serious one with

Gas Manufacturing Plants

always costly and at times a nuisance

The Oliver Method

simplifies the question in an efficient manner



At the Potrero (S. F.) Plant of the Pacific Gas & Electric Co.
in a concrete tank 48′ x 21′ x 10′
eight 24 Tube Oliver-Borden Thickners
are handling 8,000 gallons of wash water per minute
Clear water is delivered to the bay

Oliver Continuous Filter Co.

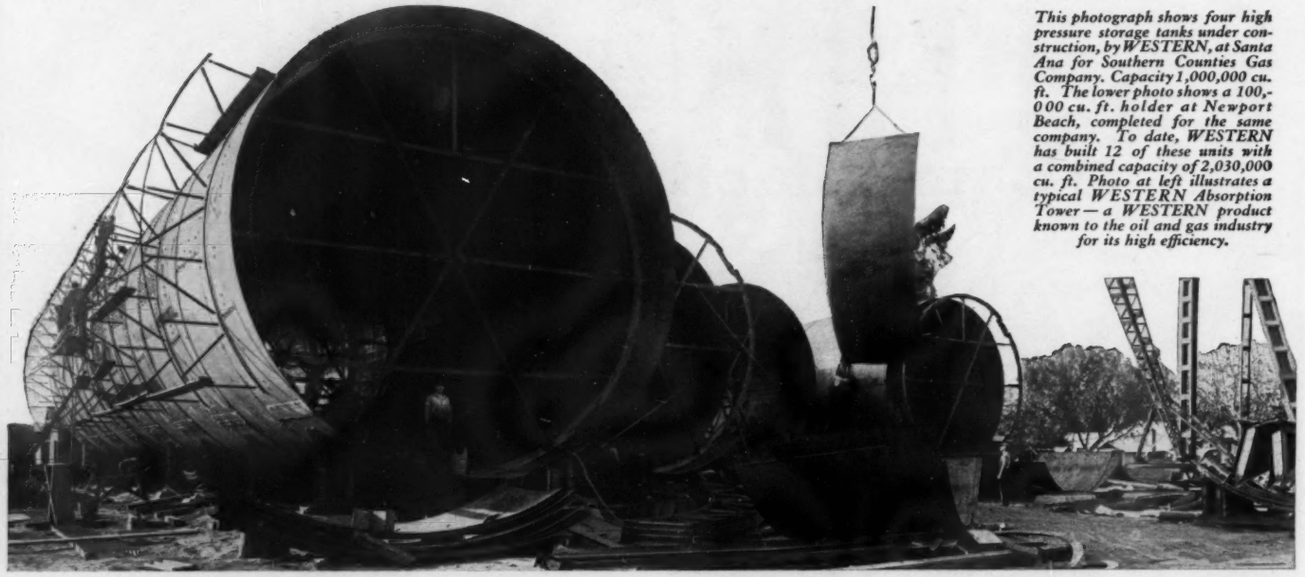
SAN FRANCISCO
503 Market Street

NEW YORK
33 West 42nd Street

LONDON
11 Southampton Row

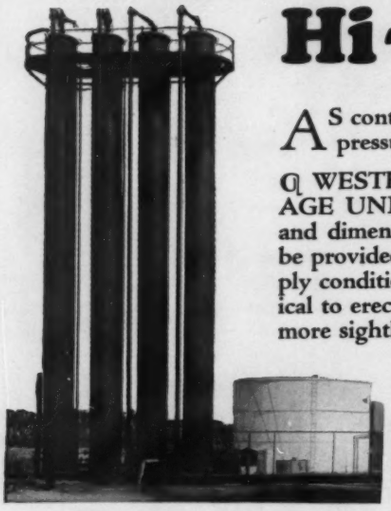
JOHANNESBURG, SOUTH AFRICA
E. L. Bateman, The Corner House

IN THE WEST ∞ IT'S "WESTERN"



This photograph shows four high pressure storage tanks under construction, by WESTERN, at Santa Ana for Southern Counties Gas Company. Capacity 1,000,000 cu. ft. The lower photo shows a 100,000 cu. ft. holder at Newport Beach, completed for the same company. To date, WESTERN has built 12 of these units with a combined capacity of 2,030,000 cu. ft. Photo at left illustrates a typical WESTERN Absorption Tower — a WESTERN product known to the oil and gas industry for its high efficiency.

Many advantages in WESTERN Hi-Pressure Gas Units



AS contrasted with low pressure... high pressure has many advantages.

¶ WESTERN HORIZONTAL STORAGE UNITS can be erected to any size and dimensions desired, and can quickly be provided when and where load and supply conditions dictate. They are economical to erect and in appearance are much more sightly than the usual type of holder.

¶ There are no moving parts, action is automatic and noise and odor are eliminated. Natural gas is not required as fuel for operation. Service is greatly improved.

¶ Every member of the gas industry should know more about Horizontal High Pressure Gas Holders . . . a product pioneered by WESTERN.

Detailed information on request.

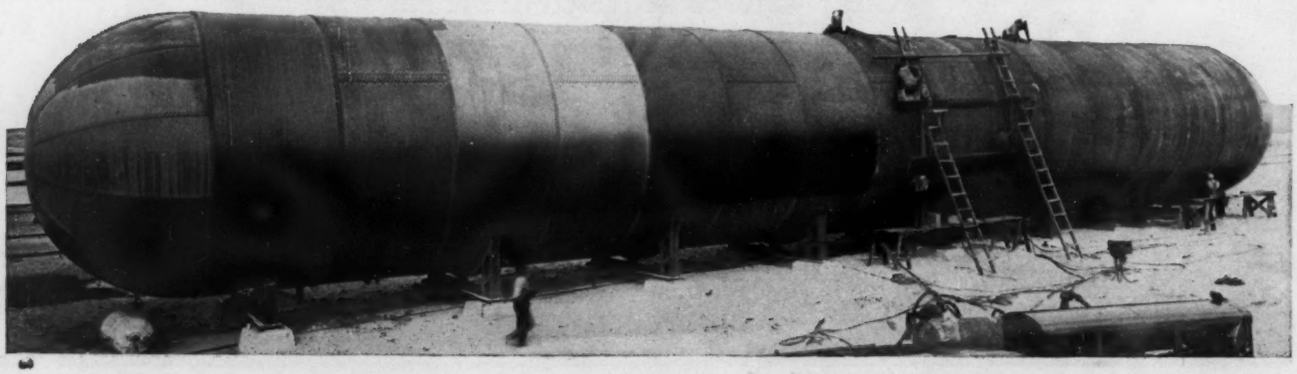
Investigate **WESTERN ABSORPTION PLANT EQUIPMENT** *and* **WESTERN AUTOMATIC ELECTRIC WELDED PIPE**

WESTERN PIPE & STEEL COMPANY

5717 Santa Fe Ave. LOS ANGELES — **OF CALIFORNIA** — **444 Market Street SAN FRANCISCO**

FACTORIES

· LOS ANGELES · SOUTH SAN FRANCISCO · FRESNO · PHOENIX · TAFT ·



WESTERN GAS

Joint Sessions of Oil Men and Natural Gasoline Operators. Dated for January 19, 20 and 21 at Los Angeles, California

The West Plays Host *to* Petroleum Institute *and* Natural Gasoline Manufacturers

Joint Sessions of Oil Men and Natural Gasoline Operators Dated for January 19, 20 and 21 at Los Angeles, California

CALIFORNIA is to play host to the American Petroleum Institute for the first time since that body's formation when Institute members gather in Los Angeles for the organization's sixth annual convention, January 19-21, inclusive. Oil men of every rank and classification will come from every quarter to attend convention sessions, and to gain a first-hand knowledge of what the Far West is doing in the industry.

Convention headquarters will be made at the Los Angeles Biltmore, and no stone has been left unturned to assure delegates of adequate accommodation. The program, both as to sessions and entertainment features, is of such a character as to well repay Eastern and Mid Continent oil men for their journey.

The natural gas gasoline industry is to have its due of recognition in the convention proceedings, the cooperation of the Association of Natural Gasoline Manufacturers having been secured to this end. Wednesday, January 20, is to be devoted to group sessions, natural gasoline subjects occupying the attention of Group 4. This group's meetings are to be joint sessions between members of the Institute and members of the Association of Natural Gasoline Manufacturers, and the program has been arranged by the natural gasoline organization under the direction of A. V. Bourque, secretary.

Group 4 will hold two sessions on Wednesday, one at 10:00 in the morning and one at 2:00 in the afternoon. Harry J. Bauer, president of the Pacific Gasoline Company, Los Angeles, will preside over these group sessions.

Opening the morning session will be an address by E. L. Peck, president of the Association of Natural Gasoline Manufacturers, on the subject: "Natural Gasoline—Its Present Position and Future Outlook." Discussion following its presentation will be led by A. M. Ballard of the Sun Oil Company. "What is Good Natural Gasoline from the Standpoint of the Refiner?" will be the topic of an address scheduled for the morning session, the speaker having not as yet been selected. A California man will probably handle this subject, and the discussion following will be led by R. E. Bering, president of the California Gasoline Corporation, Los Angeles.

F. E. Rice of the Phillips Petroleum Company will speak on "Methods of Manufacture, Past and Present" at the afternoon session. S. B. Mosier of the Signal Gasoline Company, of California will lead the discussion on this topic. D. E. Buchanan of the Chestnut and Smith Corporation will also deliver an address, his subject to be announced. Discussion will be led by F. S. Wade of

(Con. on Page 28)

H. J. Bauer, who will preside over natural gasoline sessions at Institute Convention

A. V. Bourque, Secretary of Association of Natural Gasoline Manufacturers

Harry L. Masser

Walter M. Berry

C. C. Shoemaker

Carbon Monoxide Poisoning Investigations *in* Los Angeles Covered *in* Report

Technical Sub-committee of Mayor's Committee Submits Significant Report upon Investigations and Inspection

DURING last winter there occurred in Los Angeles a relatively large number of casualties resulting from the improper use of heating appliances or from the use of appliances improperly adjusted and burned for prolonged periods of time in rooms without proper ventilation. Because of the seriousness of the situation, Mayor Cryer of that city appointed a general committee to report upon this matter. Upon taking up their investigation, this committee found that it would be necessary to carry on very careful experimental work and make rather far reaching investigations into the matter of design and operation of gas appliances and the work of other organizations and cities in coping with this same problem.

A technical sub-committee was therefore appointed, consisting of C. C. Shoemaker and George L. Metcalf, Engineers of the City of Los Angeles, Board of Public Utilities; Walter M. Berry, Executive Engineer of the California Gas Research Council; R. M. Conner, Director of Testing Laboratories, American Gas Association; Louis Mellinkoff, representing the plumbing industry of the City; and H. L. Masser, Chairman, Gas Engineer, Los Angeles Gas and Electric Corporation.

The report of this committee covered the careful testing, under a wide range of operating conditions, of a representative number of gas appliances sold in the Los Angeles market, for the purpose of determining whether such appliances are safe or dangerous. This work indicated in a number of cases the necessity of improvement of appliance design in order to assure safety. While such tests were being conducted the committee made a thorough study of the effects of carbon monoxide poisoning, as well as the effects of lack of proper ventilation of fresh air supply in living rooms where gas or any other fuel was being burned. These studies indicated conclusively the need for better regulations in order to safeguard the public health.

To provide such safeguards the committee determined that this could only be accomplished by the enactment of additional and more stringent city ordinances governing the sale and installation of gas appliances. Several suggestions have already been made in regard to such an ordinance and this committee has carefully considered all such ideas and has endeavored to use the best of them for preparing an ordinance which would assure the maximum of public safety and also provide a workable form which could be put into effect and enforced.

The underlying principle of safety set forth in this ordinance is to first require that all gas appliances hereafter sold in Los Angeles shall be inherently safe under a wide range of operating conditions, and secondly that such appliances installed in buildings hereafter constructed or piped for gas shall be provided with either vents or ventilators, thereby precluding the possibility that the room atmosphere might become unsafe. Further provision is also made for the inspection of all existing gas installations by the city in order to provide for the elimination of known hazardouus conditions. Unless such inspection is made, accidents undoubtedly will continue to occur where persons are using appliances which are improperly installed or seriously out of adjustment. By this suggested ordinance the city will properly test and pass upon the safety of all appliances hereafter sold and such appliances will bear a label indicating the city's approval. By this means purchasers will be prevented from buying dangerous gas appliances.

The following abstract indicates the scope of matters covered by this newly suggested ordinance:

"An ordinance regulating the sale and installation of appliances, tubing, devices, and appurtenances for use in con-

nection with natural, mixed, or manufactured gas in the city of Los Angeles, requiring the same to be tested, and registered with, and approved by the Board of Public Utilities and Transportation before being sold; providing for the labeling of appliances, designating make, type and registration number; defining terms; stating specifications for appliance approval; providing for the inspection of appliances, the cancellation of registration and the publication of lists of appliance registrations; providing for the licensing of dealers in gas appliances and the registration, examination and licensing of gas fitters and the suspension of such licenses; providing for the inspection of all existing gas installations for safety; providing for the installation of gas vents or ventilators and connections thereto; regulating the sale of second-hand appliances; providing for instructions covering appliance installation and adjustment and requirements for initial adjustment; authorizing the Board of Public Utilities and Transportation to promulgate rules and regulations; authorizing certain exemptions; and providing penalties for violation of provisions of this ordinance."

(Signed) HARRY L. MASSER,
Chairman of Sub-committee of Mayor's General Committee on Carbon Monoxide Poisoning.

Below appears the sub-committee's summary and general conclusions to its report, outlining in considerable detail the course of the investigations made, and presenting the sub-committee's recommendations.

Deaths Classified in Report

The investigation made by the sub-committee shows that the 28 fatal and 14 non-fatal asphyxiations that occurred during the past winter can be segregated as to cause as follows:

Cause	*Fatal*	*Non fatal*	*Total*
Accidental	2		2
Appliance Operation	19	14	33
Suicide	1		1
Gas Tubing	2		2
Uncertain	4		4
Total	28	14	42

When it is realized that there are over 500,000 households supplied with gas in Los Angeles and the immediate vicinity it will be seen that the death rate is about one person per 20,000 households, or one person in 60,000 population, not a particularly high rate when compared with accidents from other causes. Most of the accidents are preventable, however, and the gas industry and city authorities should use every means to reduce them to a minimum.

In order that the dangers of carbon monoxide poisoning might be fully understood and appreciated, a section of this report is given to a detailed account of studies of this subject made by Government investigators. It is believed that even the medical profession are not as yet entirely familiar with the diagnosis and treatment of chronic or acute carbon monoxide poisoning. Public institutions such as the emergency and general hospitals should be prepared and qualified to give proper treatment for such cases as may come to their attention. The public also should be informed as to the symptoms of gas poisoning in order that appropriate emergency action may be taken in such cases.

Cause of Production of CO

The complete combustion of all commercial fuels produces two gaseous products—water vapor and carbon dioxide. Where the supply of oxygen is restricted or the combustion process impaired, all the carbon of the fuel will not be burned, and carbon monoxide will be produced. The combustion of one cubic foot of 850 B. t. u. mixed gas consumes the oxygen of 7.9 cubic feet of air, and produces 0.87 cubic feet of carbon dioxide and 1.7 cubic feet of water vapor. From these figures it is apparent that a continually replenished fresh air supply is necessary with the use of gas as with any other fuel.

The mixed gas supplied in Los Angeles is very low in carbon monoxide, averaging below four per cent, and the natural gas contains none whatever. Studies made in eastern states and in England, where coal gas or water gas is used containing as high as 40 per cent of carbon monoxide, show that the quality of the unburned gas has no effect upon the safety of its use. Dangerous conditions result almost always from the production of carbon monoxide due to imperfect combustion of the gas.

R. M. Connor

Quality of L. A. Gas

The gas distributed in Los Angeles consists of a mixture of approximately equal parts of natural and manufactured gas, having a heating value of 850 B. t. u. per cubic foot. Service requirements are extremely difficult for the distributing utilities to meet, as there is a tremendous fluctuation between the summer and winter demands for gas. The daily variation amounts to about five to one, while during a single day the hourly demand for gas varies as much as 25 to one. This situation requires that all gas producing and distributing facilities be of enormous capacity to meet the heavy peak loads placed upon them. In spite of this situation, the heating value of the mixed gas seldom fluctuates seriously, and as high-pressure distribution systems are used in districts remote from supplies, the gas pressure is maintained reasonably constant. Because of the large supply of natural gas available for mixing with the manufactured gas, it is possible to serve a gas of high heating value that is practically devoid of sulphur or other detrimental impurities.

Tests of Appliances

With the almost universal use of gas for heating purposes in Los Angeles and vicinity, and the large number and variety of gas appliances sold, it appeared advisable that detailed studies and tests be made of a number of representative types of heating appliances to determine their safety when operated at different pressures and gas rates, and under a condition where the ventilation was restricted, simulating conditions often found in the homes.

In order to determine what types of appliances should be tested, the sub-committee made a fourth segregation of the gas asphyxiations according to types of appliances responsible for the accidents. The list is as follows:

	Fatal	*Non-fatal*	*Total*
Radiant Heaters	6	8	14
Radiators, nonvented	2	0	2
Radiators, vented	1	0	1
Portable heaters, blue flame	6	1	7
Portable heaters, yellow flame	5	4	9
Water heaters	6	0	6
Total	26	13	39

The above tabulation does not, of course, give any information regarding the relative safety of one type of appliance compared with another, since there is no information to show the number of appliances of each type in use. The following tabulation shows the number of appliances of each type tested by the sub-committee:

(Continued on Page 26)

Union Bank Building
Heated with Gas

Gas *Is the* Logical Fuel *for* Heating Large Buildings

Los Angeles Experience with Low Pressure Steam Heating Load Is Evidence for Gas

By HARRY L. WARREN

Southern California Gas Company

THE condition of the atmosphere in dwellings and public buildings is of such importance to health and vigor of mind that heating and ventilation are receiving more and more attention as sanitary science is better understood. Since the advent of the open hearth, numerous categories of heating contrivances and heating systems have been evolved. Of these, low pressure steam occupies the apex of desirability and economy. On account of its almost universal use in the heating of structures of any consequence, we may consider the superiority of this system of heating as axiomatic.

The gas industry manufactures a product that makes possible still greater improvements and refinements of operation of this accepted system of heating. But the consumer and his professional advisors, the architect and the engineer, are not aware of its practicability and economic feasibility. In fact, when one attempts to sell the advantages of a gas-fired installation, he meets a veritable mountain of resistance. He finds the prospective consumer surrounded by barriers of habit, unfavorable experience, erroneous analysis, skepticism and prejudice, as well as the ever active forces of competition.

It is a popular opinion that gas is a very expensive fuel. The man from the East has usually arrived at this conclusion, due to the fact that he has tried to use gas in an old coal furnace, equipped with makeshift burners, where the gas rate was 100 per cent higher than that of local gas companies. The Californian has arrived at this erroneous conclusion because he has been exposed to a deluge of inferior appliances, incapable of even a moderate efficiency with gas fuel. The architect and the engineer sincerely believe that the cost of gas fuel is prohibitive in installations of any size because they have been so busy producing blueprints that they have failed to spend any time conscientiously investigating the merits of a new use for what they know to be a superior fuel. They shy at something new or unfamiliar, while their several unsuccessful attempts to convert appliances designed to burn coal to the use of gas have increased their timidity several fold.

In the matter of load analysis many engineers are prone to make odious comparisons. For instance, it is not uncommon for load size and load characteristic to be taken as synonymous, while in reality they are absolutely separate and distinct identities.

An official of a large engineering and contracting firm in this city once compared the heating load of a very large Los Angeles office building to that of an electric power generating plant. The former is intermittent and operates between a load factor of 0.0 and 1.0, but very rarely ever reaches 1.0 and then for only a short time, while the latter is relatively constant and operates between a load factor of 1.0 and 2.0 or even more. Now it is not difficult to see that the most economical fuel or equipment for one is not just as desirable for the other. In fact, the building load requires a flexible fuel while the power load requires a fuel presenting a low cost per heat unit. In the first case a flexible automatic and simple equipment is desirable, while in the second case the load is relatively constant; the fire boxes are in an incandescent condition, which makes it possible to consume efficiently almost any kind of fuel, and the attendant machinery requires the presence of skilled mechanics capable of successfully operating the boilers. So simple, flexible and automatic boiler equipment is not essential to economical operation.

The heating problem in Los Angeles is distinctly a local one. Here, the mean temperature the year round is 59 degrees, but the spread between the early morning and noon hours is considerable. Therefore, the fuel presenting the readiest and easiest means of manually starting and stopping and automatically closely adjusting itself to the steady rise and fall of the temperature experienced should be the most suited fuel for low pressure steam heating plants in this city.

When choosing a fuel it is customary to fundamentally base all calculations of

Stowell Hotel, Los Angeles, another Gas-Heated Structure

A paper delivered on November 20, at the San Francisco meeting of the Pacific Coast Gas Association.

relative merits on thermal values only. Such an analysis indicates that oil fuel is cheaper than gas fuel by a margin of some 246 per cent. But this method of analysis leads to error, for it disregards the many and varied conditions in practical operation which not only equalize any difference in the cost of the two fuels, but usually gives the gas an advantage.

Actual Use Favors Gas

One would not expect a gas-fired installation to be over 40 per cent more efficient than the most disreputable oil-fired installation under test conditions. But it is possible and practical for a gas-fired installation to be three or four times more efficient than a first-class oil-fired installation under the load conditions actually experienced. In some cases, the fuel used for stand-by alone is sufficient to heat the building. The term "crude" as applied to fuel oil fully signifies that it is not a refined product and therefore, to take care of this condition and to effect to some extent a means of aiding combustion, the firebox is bricked up with a highly refractory material. This material is of little value until it reaches a point of incandescence, and to effect this entails a good deal of heat being given to the material. As the boiler is seldom shut off until the occupants leave the building, the heat contained in this material is lost. It is not an uncommon thing to find the safety pop valve of oil-burning boilers operating one or two hours after the steam has been shut off. Though efficiencies claimed for oil fuel boilers are often stated to be as high as 70 and 75 per cent, such efficiencies can only be obtained under the most ideal conditions of operation, and a heating load is far from ideal for oil fuel and its accompanying equipment. Regardless of the heat value of fuel oil, the fact remains that the percentage of available heat, when oil is burned, depends very largely upon the skill of the operator and the general conditions surrounding its use and application. A glance at the black smoke rolling from the several smoke stacks of the large buildings in most metropolitan districts should convince any one that the poor combustion obtained indicates a very low efficiency of the fuel oil burning equipment.

Hotel Changes to Gas

The Stowell Hotel, a 12-story building located in Los Angeles, was built in 1914 and no expense was spared to make the heating and hot water system high grade, the boilers chosen being the most widely sold and highest-priced low-pressure oil-burning type. However, shut-downs were frequent in spite of careful attention. After eight years of unsatisfactory operation these boilers were taken out and gas-fired sectional cast iron boilers installed..

Above: Los Angeles Chamber of Commerce Building, which gets heat from the largest low pressure automatic gas-fired heating system ever installed. The building contains 35,000 square feet equivalent direct radiation.

Below: View of the Chamber of Commerce gas-fired heating installation; seven 42-section boilers.

Last winter fuel oil sold for $1.50, $1.67 and $1.60 per barrel, the average price being $1.59 per barrel. Basing our calculations on the consumption of fuel oil in 1920 and 1921, the last two years that the Stowell Hotel burned fuel oil, and using the fuel oil prices of the year 1925, the fuel bill for this hotel had they burned fuel oil for the two years 1924 and 1925, would have been $5,254.95. The gas bill for this two-year period was $5,494.12. That is, at last year's fuel oil prices gas fuel and oil fuel were about at the same price level under the load conditions at this hotel.

Segregating the fuel used for heating and making a similar analysis, we find gas fuel would be 31 per cent cheaper than oil fuel. In other words, gas at a cost of 246 per cent higher than fuel oil on a heat content basis was actually the cheaper by a margin of 31 per cent under actual operating conditions. This data conclusively indicates that load characteristic is an important factor in determining the desirability of any fuel for specific purposes.

Now under the conditions of the combined hot water and heating load, the gas fuel cost was 4.55 per cent higher than the oil fuel cost, but under the conditions of the heating load alone, the gas fuel cost was 31 per cent lower than the oil fuel cost. The hot water heating load is of the storage type and the 1000 gallon tank acts as a dash pot, filling in the valleys of minimum demand and rounding off the peaks of maximum demand. Therefore, it is evident that the fuel presenting a low cost per heat unit, though relatively inflexible, will probably show a lower fuel cost on oil fuel than on gas fuel. But the heating load with its great maximums and small minimums, occurring at short intervals, with rapid and erratic sequence, shows gas to be by far the most desirable and economical fuel for this purpose.

Oil Cost Is Sole Argument

The only advantage claimed for fuel oil is its comparative low cost per unit heat value. But the owner of an office

building is not interested in purchasing dormant heat units. He wants thermal comfort at the lowest possible figure.

California fuel oil usually has a sulphur content of from 2 to 4 per cent. This impurity pits the metal of the boiler, while the concentrated high temperature flame causes undue internal stresses and strains. These factors contribute to the high maintenance experienced in oil-burning plants.

The daily cloud of black smoke caused by oil fires contributes nothing to enhancing the beauty and the cleanliness of the city, and its impracticability is reflected in the high cost entailed in the washing down at close intervals of all large office buildings where oil is used on the premises or in the vicinity.

Mr. Lewin, supervisor of construction of the Brownstein - Louis Company, which occupies a five-story daylight factory building having a cubical content of 3,000,000 cubic feet and a heating requirement of 26,000 square feet of equivalent direct radiation, writes: "In reply to your request for information bearing on our past experience with oil-burning boilers in our building at 716 South Los Angeles Street, where we conducted our manufacturing business for 10 years, and our location at 236-240 South Los Angeles Street, where we conducted our manufacturing business for seven years, we can state that after three years' experience in our new building with the gas-filled boilers installed, we would not like to have to face the same discomforts and inconvenience that we did in our old locations, all of which seem inseparable from the use of oil-burning equipment. We had constant damage from oil soot ruining many high-priced materials and merchandise, together with constant unsightly condition attendant upon the periodical delivery of the fuel oil in our shipping alley."

In fact, the cost of cleaning interiors, furnishings, etc., as well as exteriors of buildings soiled by oil soot is more than the aggregate fuel cost for these buildings.

Gas Eliminates Nuisances

Gas companies furnish a constant dependable supply of gas to the consumer's premises. The nuisances of purchase and delivery of oil as well as the necessity of storage and pumping are eliminated, while an accurate meter in the building gives honest measure and insures against transport losses. Compare, if you will, this service to that obtained when burning fuel oil.

In the type of steam-heating plants endorsed by our company, the gas is burned through atmospheric burners at constant pressure with fixed gas orifices. Since regulation is obtained through the use of snap valves, the fuel is burned at the rate for which the burner has been carefully and accurately designed. After the burners and dampers are once adjusted, an exact proportion of both primary and secondary air is assured.

The attention required by gas-fired boilers is practically negligible. The time given to starting and stopping the boilers and blowing them off every heating season should not average over two hours per day. In the case of the Stowell Hotel one attendant was eliminated and the two remaining attendants were free to devote nearly all of their time to house repairs. The Brownstein-Louis Company writes, "Another saving which should have consideration is that with the oil-burning equipment necessary for a plant of our size we would have required the constant attendance of a licensed engineer at a salary of $2400 a year. Our present plant requires an average of two hours a day supervision by a handy man who, in his spare time does a very large portion of the carpenter work and makes repairs on sewing and pressing machinery necessary in other parts of the building. His salary is $135 a month." The economy effected in labor of attendance in both of these plants was equal to the annual fuel cost.

Fuel oil is a crude product; it must be gasified before it can be burned, and the fire-box of a heating boiler is not an efficient gas producer. The operation is too intermittent and the labor costs are much higher than in a centralized gas plant. Then, too, the building owner must incur expenses, when burn-

(Continued on Page 42)

Arguments for Sale of Heating Equipment Stressed in Convention Discussion

PRESENTATION of Mr. Warren's paper on large gas-fired heating installations was followed by some very pertinent discussion from the floor of the sectional Association meeting at San Francisco, the net impression being that the paper's conclusions have wide application wherever gas is sold. Some of the pithy points educed in the discussion are given below.

Mr. Frank Mosher of San Francisco commented, in part, as follows:

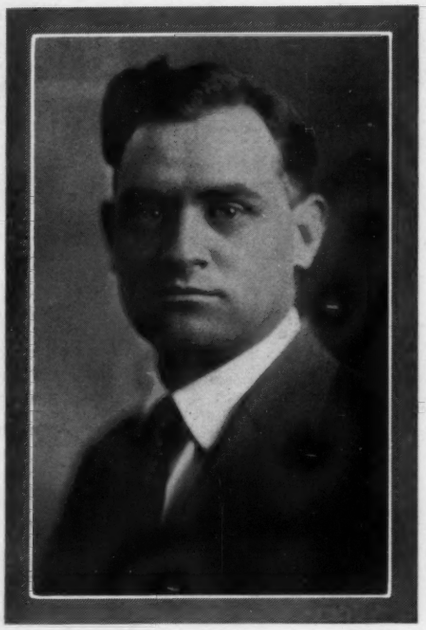
"I would like to point out that the sales argument is exactly the same in Los Angeles as in Casper, Wyoming, where you have 40 degrees below zero weather and where, incidentally, a very large percentage of gas-fired boilers are sold. The fact of the matter is that gas equipment will have to be sold and sold hard for an indefinite period to come, and as a matter of fact it can be sold under conditions very much more adverse than obtain in Los Angeles today. We are doing that in San Francisco, for instance. We are not getting them all, or any considerable proportion, but we are selling gas-fired boilers on a dollar gas, 550 British thermal units, against oil that is practically the same price as obtains in Los Angeles.

"Although they (Los Angeles installations) are larger than apply in most manufacturing sections, the theory is exactly the same in your selling argument. They are sold on the question of efficiency and labor saving, length of life, absence of depreciation, and that same argument applies in the manufactured gas field."

Gas salesmen have "got it on the other fellow from a psychological viewpoint," adds Mr. Mosher, emphasizing the convenience of gas service. "We have the same factor in our favor in heating by gas as the electric man had in lighting by electricity. We can turn our heat on from a distance."

F. U. Naylor, also of San Francisco, points the need for further study in the field treated in Mr. Warren's valuable paper. His remarks, in part, were: "It seemed that the main point made in this paper was that in selling gas-equipment and in selling gas fuel we should get the prospect to consider what it would cost him to use that fuel and not what it might cost him to buy that fuel as compared to some other fuel he might buy. From that standpoint we might do well to make a study or, perhaps, in some cases, it will be a continuation of a study that has already been started of what it would cost to purchase oil fuel for a heating system with 500 square feet of steam and compare that with the cost of gas fuel for a similar sized load; I believe that in those cases we would find that the differential in the fuel costs would be so small that the savings which can be affected in non-attendance, insurance rates, interest on capital investment, maintenance, and so on, would more than offset the difference in the two fuel costs."

To quote Mr. Naylor on the sale of gas boiler equipment for steam and hot water heating systems: "Selling them and keeping them on the job are not altogether two different problems. They are one and the same problem and if we are to keep our gas boilers sold we should sell them to the consumer with the understanding that he is to take his gas bills and average them for his heating season and bear in mind that those gas bills include not only his fuel costs, but the cost of a real heating service. In so doing there is no question but what the point developed in this paper can be pictured to the consumer so that he will see that he is not paying a premium for gas fuel."



Paul D. Barton

Natural Gasoline Engineers Organize *for* Research

Technologists from 17 Companies in Joint Study of Physical Refrigeration Process

By GEORGE H. FINLEY

ON December 2nd some 40 technical men gathered in the Shell Company's hall at the Long Beach Division headquarters to set into motion an organization that promises to affect significantly the trend of the Southern California natural gasoline industry, particularly as regards its technical aspects. This body, as yet unnamed, is composed principally of natural gasoline engineers, 17 companies operating in the California natural gasoline field being represented unofficially among those attending the formative meeting.

The immediate purpose of the new natural gasoline association's formation is to develop a rapid and accurate testing method to ascertain gasoline content of a natural gas, no satisfactory standard now existing in California or elsewhere. Investigation is particularly concerned with a development of the physical refrigeration method, to standardize this test from a chemical standpoint, and material progress has already been made toward this end.

Officers Named

Paul D. Barton, Manager of the gas department of the United Oil Company, will head the newly-formed group, his election to the presidency having taken place at the December 2 meeting. J. A. Campbell of the Lomita Gasoline Company will serve as vice-president, and J. S. Watson, gas engineer of the Shell Company, as secretary.

As far as concerns organized research in the manufacture and production aspects of the natural gasoline industry, the Southern California enterprise may be said to be first in the field, there being no organization with similar purpose in the industry, according to Mr. Barton. The work of the petroleum division of the American Chemical Society most nearly approaches that which will engage the attention of the new organization, but its investigations are more from the refining angle than from that of production. It is in investigation relating to this latter phase of the industry that the Southern California technicians will operate. The standardization of testing practice is expected to occupy an extended period of study and experimentation, during which representatives of the several companies will make individual contributions to the investigation. But the service of the organization should eventually reach to other problems in the industry; for example, Mr. Watson, the secretary, suggests that various angles of the gas measurement problem may come in for a share of attention.

J. A. Campbell

Testing for gasoline content by the physical refrigeration method, which is now under intensive study by the new organization, has been in practice for only about a year. The Standard Oil Company developed a routine testing method which has been in use in that company for some time in checking high pressure absorption yields. This method, which is a single operation process, is claimed to give a higher value of gasoline than a 30 pound charcoal pressure distillation. The Standard's method, which has not been fully developed, but is taken as the starting point for the research now under way.

Indications from Standard's Test

A preliminary report released by the association dealing with research progress to date gives the following summary of indications revealed by the Standard Oil Company's test:

(1) Cooling natural gas to the temperature obtained by a mixture of carbon dioxide snow and ethyl ether, a liquid condensate was obtained, and in most cases in considerably higher proportionate quantity than by the standard charcoal test on the same gas.

(2) The proportionate quantity of gasoline condensate so obtained was in correspondence to that actually obtained in their high pressure absorption plants.

(3) The condensate so obtained was

(Continued on Page 36)

J. S. Watson

Photographs courtesy of Fred Hartsook

PACIFIC COAST GAS ASSOCIATION

A Department Conducted by Clifford Johnstone, Executive Secretary

The Committee Personnel *for* 1926 Association Work

WE are publishing in this issue as complete a list of committees and their personnel as is available to the Secretary at this time (December 15). It is an imposing organization, and its work bids fair to eclipse even the wonderful record made by the 1925 committees.

Insofar as the work of these committees deals with the collection of statistics and the record of accomplishment during the year, they are performing an important function and they have a right to the fullest co-operation on the part of gas companies and dealers. Questionnaires are undoubtedly a nuisance, but the consolidated information derived from them is of tremendous value to the industry. Think of this and fill them out—every one—and promptly. Apropos of this, a paragraph from Mr. Skelley's 1925 Report on Customer Ownership will serve as a concrete example!

"In view of the recognized importance of this activity and the further fact that member companies are contributing a certain amount of real money toward the expense of carrying on the work of the Association from year to year, it would seem not untimely to call the attention of executives to the fact that somewhere within some of their organizations proper attention is not being devoted to the business of the Association. The report of no committee can be complete and of the greatest service unless it presents the results of a comprehensive view of the subject in the entire field to be covered. Insofar as this report presents facts and conclusions based on data from less than 50 per cent of the companies within this geographic division, in just so far it falls short of its fullest possibilities."

COMMITTEE PERSONNEL

ACCOUNTING SECTION

A. E. Peat, Southern California Gas Company—Chairman

Bonus, Premium and Group Insurance Committee

Donald E. Buyers, Portland Gas and Coke Company—Chairman
C. S. Brearty, Pacific Gas and Electric Company
R. S. Porter, San Diego Cons. Gas and Electric Company

Cost Accounting Committee

P. S. Booth, Pacific Gas and Electric Company—Chairman
H. R. Bray, Western States Gas and Electric Company
C. C. May, San Diego Cons. Gas and Electric Company
C. E. Neiderer, Portland Gas and Coke Company
O. L. Moore, Los Angeles Gas and Electric Corp.
W. E. Robbins, Southern California Gas Company
W. H. Shopp, Southern Counties Gas Company
M. W. Thernes, Spokane Gas and Fuel Company

Credits and Collections Committee

M. W. Thernes, Spokane Gas and Fuel Company—Chairman
J. A. Butler, Southern California Gas Company
Horace Cline, Los Angeles Gas and Electric Corp.
A. R. Foster, San Diego Cons. Gas and Electric Company
Fred Fischer, Midway Gas Company
G. B. Furniss, Pacific Gas and Electric Company
H. P. Humphreys, Pacific Gas and Electric Company
Geo. E. Keller, Los Angeles Gas and Electric Corp.
O. L. Moore, Los Angeles Gas and Electric Corp.
F. L. Nagel, Portland Gas and Coke Company
F. P. Raymer, Southern Counties Gas Company
H. G. Ridgeway Pacific Gas and Electric Company

Statistics Committee

W. A. Worthington, Pacific Gas and Electric Company—Chairman
P. A. Bailey, San Diego Cons. Gas and Electric Company
C. E. Crenshaw, California Railroad Commission
J. W. Helwick, Sacramento Gas Company
G. Palanca, Pacific Gas and Electric Company

San Diego Meeting Dated for January 18th and 19th

DATES for the next sectional meeting of the Pacific Coast Gas Association, to be held at San Diego, are Thursday and Friday, February 18 and 19. Headquarters will be made at the San Diego Hotel, where adequate accommodations have been arranged for those who will attend.

Although the program has not been worked out in detail it is planned to follow the scheme adopted at the last meeting in San Francisco; that is, to hold committee meetings on the first day and a general program on the second. The dinner will be arranged for the evening of either the 18th or the 19th, depending upon the hotel management's preference.

It is urged that reservations be made speedily, and direct to the San Diego Hotel.

Joseph Sodoma, Southern Counties Gas Company
H. H. Stuart, Portland Gas and Coke Company

Undistributed Costs Committee

E. N. Simmons, Los Angeles Gas and Electric Corp.
W. S. Cluff, Pacific Power and Light Company
W. L. Fitzpatrick, Tacoma Gas and Fuel Company
J. G. Hawkins, Pacific Power & Light Company
A. C. Johnston, Southern California Gas Company.
W. J. McCoy, Southern Counties Gas Company
H. T. Terry, Pacific Gas and Electric Company

COMMERCIAL SECTION

T. J. Protheroe, Southern California Gas Company—Chairman

Advertising Bureau

Clyde H. Potter, Southern Counties Gas Company—Chairman
Geo. A. Campbell, Truckee River Power Company
A. E. Duncan, James Graham Mfg. Company.
J. H. Hartog, Portland Gas and Coke Company
F. H. Holden, Southern California Gas Company
J. C. Jordan, Pacific Gas and Electric Company
Frank Packer, Welsbach Company
H. E. Young, Payne Furnace & Supply Company

Appliance Sales Committee

F. U. Naylor, Pacific Gas and Electric Co.—Chairman

Dealers Bureau

B. S. Pedersen, George M. Clark & Company—Chairman
Geo. Finney, Gas Appliance Association of Southern Calif.
Ray Logue, Beacon Light Company.
J. E. Moore, A. B. Stove Company
E. L. Payne, Payne Furnace and Supply Company

Home Service Bureau

C. R. Miller, Portland Gas and Coke Company—Chairman

Industrial Sales Committee

C. M. Grow, Southern California Gas Company—Chairman
F. M. Banks, Southern California Gas Company
H. W. Elder, San Diego Cons. Gas and Electric Company
L. C. Haffner, Portland Gas and Coke Company
A. J. Hill, Pacific Gas and Electric Company
Lee B. Mettler, Lee B. Mettler Company
H. L. Warren, Southern California Gas Company

Refrigeration Committee

J. H. Gumz, Pacific Gas and Electric Company—Chairman
Chas. A. Carlson, Pacific Gas and Electric Company
Ray Trowbridge, Pacific Gas and Electric Company
J. D. Van Valkenburgh, Portland Gas and Coke Company

PUBLIC RELATIONS SECTION

W. H. Barton, Portland Gas and Coke Company—Chairman

Company and Employee Relationships Committee

E. G. McCann, Pacific Gas and Electric Company—Chairman
R. G. Arthur, Douglas Gas Corporation
Norwood W. Brockett, Puget Sound Power and Light Company
J. C. Gilbert, Southern Counties Gas Company
C. R. Johnson, Portland Gas and Coke Company
O. L. Moore, Los Angeles Gas and Electric Corp.
L. H. Stratford, Pocatello Gas and Power Company

Customer Ownership Committee

F. E. Seaver, Los Angeles Gas and Electric Corp.—Chairman
C. E. Holt, Pacific Gas and Electric Company
Sumner C. Palmer, Jr., Tacoma Gas and Fuel Company
S. E. Singer, Southern California Gas Company
S. E. Skelley, Portland Gas and Coke Company

Employees Education and Training Committee

H. J. Smith, Pacific Gas and Electric Company—Chairman
F. V. Boller, San Joaquin Light and Power Corp.
L. H. Dell, Southern California Gas Company
H. K. Griffin, Western States Gas and Electric Company
A. A. Salmon, Spokane Gas and Fuel Company
D. L. Scott, Los Angeles Gas and Electric Corp.

Improved Methods of Handling Transactions Committee

J. G. Bourus, Tacoma Gas and Fuel Company—Chairman
F. C. Brewer, North Pacific Public Service Company
Rufus Gentry, Public Service Company of Colorado
Alfred May, San Diego Cons. Gas and Electric Company
F. L. Nagel, Portland Gas and Coke Company

Legislation Affecting Utilities Committee

George L. Myers, Portland Gas and Coke Company—Chairman
Norwood W. Brockett, Puget Sound Power and Light Company
C. P. Cutten, Pacific Gas and Electric Company
Rufus Gentry, Public Service Company of Colorado
Paul Overton, Los Angeles Gas and Electric Corp.

Public Information Committee

R. E. Fisher, Pacific Gas and Electric Company—Chairman
C. M. Brewer, Mountain States Power Co.

A. B. Day, Los Angeles Gas and Electric Corp.
R. G. Gentry, Public Service Company of Colorado
J. H. Hartog, Portland Gas and Coke Company
W. F. Raber, San Diego Cons. Gas and Electric Company
Don C. Ray, Pacific Gas and Electric Company

Relations with Educational Institutions Committee

L. M. Klauber, San Diego Cons. Gas and Electric Company—Chairman
Walter M. Berry, California Gas Research Council
R. C. Cardell, Missouia Gas and Coke Company
Darrah Corbet, Chas. C. Moore & Company
C. L. Cory, University of California
C. N. Cross, Stanford University
S. H. Graf, Oregon State Agricultural College
E. L. Hall, Portland Gas and Coke Company
R. J. Jenks, Pacific Power and Light Company
John D. Kuster, Pacific Gas and Electric Company
O. L. Moore, Los Angeles Gas and Electric Corp.
L. H. Newbert, Pacific Gas and Electric Company
F. W. Olsen, Mountain States Power Company
B. F. Raber, University of California
J. L. Stone, Spokane Gas and Fuel Company
J. T. Sullivan, Truckee River Power Company
C. H. Webber, Tucson Gas, Electric Light and Power Company

TECHNICAL SECTION

Frank Wills, Pacific Gas and Electric Company—Chairman

Distribution Bureau

R. M. McCalley, Portland Gas and Coke Company—Chairman

Load Factors Committee

W. M. Henderson, Los Angeles Gas and Electric Corp.—Chairman
L. L. Biggs, Southern California Gas Company
C. G. Fiscus, Western States Gas and Electric Company
Otto Goldkamp, San Diego Cons. Gas and Electric Company
V. W. Harper, Portland Gas and Coke Company
J. E. Kelley, Western States Gas and Electric Company
W. F. Pape, Pacific Gas and Electric Company
S. C. Singer, Southern California Gas Company
R. V. Wilson, Pacific Gas and Electric Company

Materials and Methods Committee

D. H. Perkins, San Diego Cons. Gas and Electric Company—Chairman
A. R. Bailey, Los Angeles Gas and Electric Corp.
P. D. Carroll, Los Angeles Gas and Electric Corp.
S. H. Graf, Oregon State Agricultural College
D. B. Larson, Portland Gas and Coke Company
W. F. Pape, Pacific Gas and Electric Company
D. E. Weddersheim, Western States Gas and Electric Company
F. E. Wood, Southern California Gas Company

Pipe Protection Committee

S. H. Graf, Oregon State Agricultural College—Chairman
H. A. Lee, Portland Gas and Coke Company
M. E. Waite, San Diego Cons. Gas and Electric Company

Records and Maps Committee

R. E. Cole, Portland Gas and Coke Company—Chairman
R. C. Cavell, San Diego Cons. Gas and Elec. Company
J. W. Clelland, Southern California Gas Company
A. B. Overholtzer, Pacific Gas and Electric Company
G. W. Stewart, Los Angeles Gas and Elect. Corp.
H. M. Thomas, Pacific Power & Light Company

Unaccounted for Gas Committee

B. G. Williams, Southern California Gas Company—Chairman
J. R. McLaughlin, Southern Counties Gas Company
D. H. Perkins, San Diego Cons. Gas and Electric Company
F. O. Suffron, Portland Gas and Coke Company
W. F. Tyler, San Joaquin Light and Power Corp.
R. V. Wilson, Pacific Gas and Electric Company

Manufacturing Processes Bureau

F. J. Gartland, Public Service Company of Colorado—Chairman

Coal Carbonization Committee

John Keillor, British Columbia Electric Railway Company, Ltd.—Chairman

Water Gas Committee

F. C. Hawks, Tacoma Gas and Fuel Company—Chairman

Meter Bureau

E. A. McCallum, Pacific Gas and Electric Company—Chairman

Statistics Committee

D. E. Farmer, Portland Gas and Coke Company—Chairman
Hartwick Barnes, San Diego Cons. Gas and Electric Company
Oscar Cook, Los Angeles Gas and Electric Company
James E. C. Currens, Western States Gas and Electric Co.

Testing and Repairs Committee

F. H. Coble, Southern California Gas Company—Chairman
Samuel Bangerter, Los Angeles Gas and Electric Company
D. E. Farmer, Portland Gas and Coke Company
Otto Goldkamp, San Diego Cons. Gas and Electric Company
Daniel J. Gray, Pacific Gas and Electric Company

Purification Bureau

J. M. Dickey, Pacific Gas and Electric Company—Chairman

Liquid Purification Committee

Kenneth N. Cundall, Pacific Gas and Electric Company—Chairman
Van E. Britton, Pacific Gas and Electric Company
R. H. Hargreaves, Pacific Gas and Electric Company
Elton Hogg, Pacific Gas and Electric Company
M. M. Katz, Public Service Company of Colorado
Ludwig Rosenstein, San Francisco

Organic Sulphur Committee

S. C. Schwartz, Portland Gas and Coke Company—Chairman
W. W. Flanders, Tacoma Gas and Fuel Company
D. J. McCarthy, Pacific Gas and Electric Company
Wm. C. McIndoe, Standard Oil Company
J. A. North, Los Angeles Gas and Electric Corp.

Oxide Purification Committee

J. E. Spelce, California Railroad Commission—Chairman
F. C. Jones, Pacific Gas and Electric Company
D. J. McCarthy, Pacific Gas and Electric Company
C. E. White, San Diego Cons. Gas and Electric Company

Refractories Bureau

H. L. Masser, Los Angeles Gas and Electric Comporation—Chairman

Checkerbrick Committee

James W. Moncrieff, Stockton Firebrick Company—Chairman
M. J. Cereghino, Los Angeles Gas and Electric Corp.
J. M. Dickey, Pacific Gas and Electric Company
S. H. Graf, Oregon State Agricultural College
R. H. Hargreaves, Pacific Gas and Electric Company
H. J. Knollman, Los Angeles Gas and Electric Company
W. M. Morin, Pacific Abrasive Supply Company

Insulation Committee

Lyle Caldwell, Celite Products Company—Chairman
C. L. Buratti, Johns-Manville, Inc.
J. E. Kelley, Western States Gas and Electric Company
V. R. Sullivan, Stockton Firebrick Company
H. J. Knollman, Los Angeles Gas and Electric Corp.
R. G. Watt, Southern California Gas Company

Refractories Committee

H. A. Huisken, The Vitrefrax Company—Chairman Ray Boggs, American Refractories

Safety Bureau

R. V. Hughes, Pacific Gas and Electric Company—Chairman
R. R. Blackburn, Southern California Gas Company
R. J. Casad, San Joaquin Light and Power Corp.
E. H. DeGarmo, Los Angeles Gas and Electric Corp.
Alfred May, San Diego Cons. Gas and Electric Company
Norman H. Wardale, Portland Gas and Coke Company
C. H. Wilcox, Los Angeles Gas and Electric Corp.

Steam Production Bureau

C. M. Cole, Southern California Gas Company—Chairman

Transportation Bureau

W. H. Drake, Portland Gas and Coke Company—Chairman
S. B. Shaw, Pacific Gas and Electric Co.

The Home Service Manual

THE Home Service Committee hopes to have its Gas Appliance Manual ready for the printer shortly after the first of the year. The material already submitted to the Association in mimeographed form is being rearranged to bring all data relative to specific types of appliances into the same chapters. This arrangement will permit of reprints being made of separate chapters if these are wanted in quantity by any of our members. During the rearrangement, careful consideration is being given to all constructive suggestions received.

The Directors have authorized the printing of one thousand copies of the Manual and have instructed the Secre-

(Continued on Page 27)

Correspondence Course in Gas Engineering Starts

THE correspondence course being given by Columbia University under the auspices of the American Gas Association is now well under way and several members of the Association have enrolled. An announcement of this course was carried in the May issue of *Western Gas*, and also in bulletins issued by the Secretary during the past year.

The Secretary has been in correspondence with Prof. J. J. Morgan who is in charge of the work for Columbia University and is informed that the text of the course is now available in pamphlet form. This text will eventually be published in book form and it is estimated it will make a book of about 700 pages. In the meantime it is being sent to students in a photostated pamphlet form of 32 pages to the pamphlet. The first five of these have been sent to your Secretary and an inspection shows that the contents are of great educational value.

The entire series of pamphlets can be secured for $10 post paid, the purchaser being sent all those issued at the time of his order and receiving the others as they are prepared. This does not, of course, include the syllabus or instruction which go with the regular correspondence course, but the Secretary would like to suggest the plan that one man of a group subscribe for the entire course, the others purchasing the text. In this way local classes can be formed with very beneficial results. Orders for the text may be sent either to the Secretary or direct to Prof. J. J. Morgan, Columbia University, New York City. The cost of the entire course is $60.

Proceedings—Volume 16

AS this is written, an effort is being made to have Volume 16 of the Proceedings in the hands of all members as a New Year's present. It is a notable contribution to the literature of the gas industry, and will provide valuable reading and reference matter for years to come. It is significant that our Proceedings each year become more and more a record of actual accomplishment and purposeful investigation, and in Volume 16 the spirit which pervades Pacific Coast gas men is portrayed on every page. Our industry is progressing soundly, and every Association member has a right to feel proud of the part he is playing. A worthy purpose and a fighting heart make nothing impossible. Carry on!

EDITORIAL

A Carbon Monoxide Investigation

DURING the winter of 1924 the reading public and the Western Gas industry generally were repeatedly shocked by sensational news reports of fatalities in Los Angeles and vicinity, due to carbon monoxide poisoning. It was appreciated at the time that considerable exaggeration accompanied the press accounts, but it was also recognized that the interests of public safety demanded some action.

To cope with this situation a general committee was appointed by Mayor Cryer of Los Angeles. This committee in turn appointed a technical sub-committee to undertake a careful investigation into the local carbon monoxide situation and to report back to the general committee.

A number of eminent gas engineers have co-operated in the preparation of this report. Their work involved investigation into causes of the deaths charged to carbon monoxide poisoning, detailed inspection of a number of gas appliances marketed in Los Angeles, and formulation of recommendations for remedying certain existing conditions.

This report is now concluded and a summary of the investigations and general conclusions which make up its contents appears in this issue. *Western Gas* takes particular pleasure in offering this feature to its readers in advance of general publicity, for the work of the sub-committee has been one of consequence. It is recognized to be of more than local importance, and the findings will have wide application throughout the industry. In ensuing issues some of the outstanding sections of the report will be published in *Western Gas.*

Solving a Trade Problem Together

A FEW months ago a group of natural gasoline engineers in Southern California began to co-operate in the solution of a technical problem—the testing of natural gas for gasoline content by the physical refrigeration method. Elsewhere in this issue are given some of the particulars of their investigation. From this joint endeavor has grown a permanent association of natural gasoline engineers, 17 or more operating companies being unofficially represented in the membership, which is open to all who care to join.

That technical research can proceed co-operatively and in the open, for the betterment of an entire industry, is a new earmark of industrial progress. It used to be that research was exclusively the function of the individual company's laboratory, and any innovations in process or apparatus that were developed were guarded closely. To some degree this order will always prevail, but to a growing extent the element of co-operation is affecting every field of private initiative. And that this is beginning to be true in the technical field is a tribute to the vision of industrial leaders, who are coming to realize that a sharing of knowledge does not always violate the principles of sound competitive business practice.

Humorous, but True

IN the Los Angeles Examiner there regularly appears a department running under the colorful caption "Cook-Coos", conducted in whimsical vein by one who knows the "how" of tickling the reader's risibilities. In a pre-Christmas shopping column the humorist helpfully offers several gift suggestions, chief among which are a "pump-your-own" organ, a rubber-tired surrey, and—gift of gifts—a folding bath tub.

When standing inconspicuously erect this latter article might have adorned any boudoire, back in the 'Eighties, and no doubt could have been passed off as a cabinet in the drawing room, until Saturday night rolled around. Then, marvel of ingenuity, the erstwhile cabinet was metamorphosed into a unique but practical *tubbe de bathe.* A built-in coal burner heated the water "at the bath, as you want it" to quote the ad-copy of that far away period. "No water to carry" was an effective slogan for the appliance salesman, and the zinc-lined models proved especially good sellers, appealing to the popular pocket-book.

Perhaps a lesson may be gleaned from this overdrawn bit of newspaper humor. We wonder if the Western buying public are using gas appliances designed back in the folding-bath-tub period. Some prospects, perhaps, still rest content in the opinion that the heat provided by coal or other solid fuels is good enough. It rests with the new business departments of gas companies everywhere to bring the convenience and efficiency aspects of gas service convincingly before this type of householder, so that he can make one more in the growing total of those converted to "gas for domestic use."

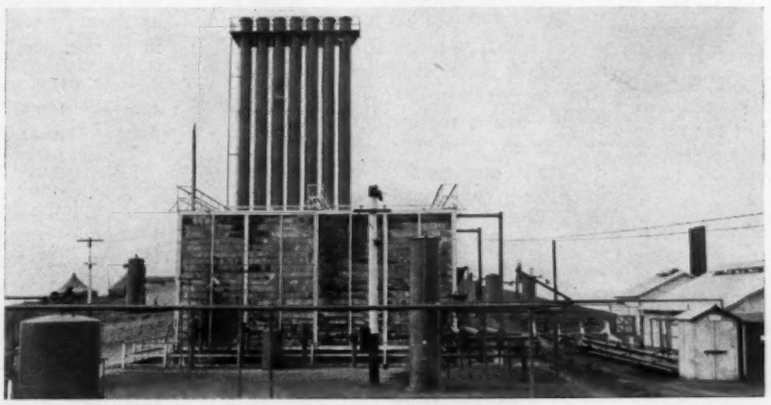
Testimony *of* Natural Gasoline Operators Shows Growth *of* Industry *in* Past Year

Increase in Gallonage Recovered and New Plant Construction Show Significant Expansion in Western Casinghead Operations

TOWARD the close of 1925 *Western Gas* sent out a short questionnaire to the leading natural gasoline operators in the West, with the object in mind of presenting to our readers some first hand evidence on the growing importance of this industry. We were, of course, guided by our personal belief that the past year has witnessed a measureable development in western natural gasoline operations, and this conclusion was well supported in the returns to our questionnaire.

Two questions were especially significant as revealing extent of operations in 1925 as compared with the year previous. To the question: "What were the approximate totals for 1925 and 1924, for amount of gas handled?", 11 of the companies which returned answers showed an increase. These companies represented slightly over 50 per cent of those replying. If they may be taken as typical of the rest in the field, and among them are listed many of the major operators, it might fairly be concluded that the "amount of gas handled" measure shows increase in operations. But more certain conclusions may be drawn from the question: "What were the approximate totals for 1924 and 1925, for gasoline recovered?" To this 16 of the companies' replies showed definite increases. Operations of the companies reporting represented a total gallonage recovered in 1924 of approximately 91,000,000. The total reported by the same companies for 1925 was approximately 113,000,000, or an increase of more than 24 per cent. These figures would seem to reveal a measureable development within the companies reporting, as well as indicating that the companies replying to the questionnaire represented a very considerable portion of the field, in point of operations.

Several of the companies made report of new plants put into operation in 1925, the new plants totalling 14 as compared with 11 completed in 1924. Since the natural gasoline industry's expansion necessarily depends much upon factors over which the operators have little control it is almost impossible to predict what may be expected in the coming year as to construction of new plants, increase in gallonage, etc.; however, a number of companies advanced plans for adding equipment to plants now operating. The rapidity with which adequate facilities were rushed into service for handling gas in the Ventura fields and other districts where new oil development took place in 1925 would indicate that western companies are losing no opportunities to expand when natural gas supply makes expansion possible.



The two views above are of property of the Pacific Gasoline Company, largest operator in the western natural gasoline industry. Top: Pacific Gasoline Company's recently completed Ventura Plant No. 2, constructed to take advantage of new developments in that district. The plant is of 10,000 gallons daily capacity. Bottom: Field headquarters of same company in the Los Angeles Basin, at Santa Fe Springs

A few isolated examples are offered below from a host of others as typical of expanded operations in the past year, and as indicating future development.

The Pan American Petroleum Company reports construction of one combination compression and oil absorption plant in the Baldwin Hills field, Inglewood, Calif., and additions were made to the company's Crampton 3 gas plant during 1925. Two plants were put into operation by the Lovell Gasoline Company. One plant was moved and placed in operation in June of last year by the U. S. Refining Company. The Sentinel Oil Company erected one absorption-compression plant, and the General Petroleum Corporation also reports a new plant constructed in 1925. Seven new plants were added to the system of the Pacific Gasoline Company last year, and the Ventura No. 1 plant was increased in daily capacity from 1,000 to 10,000 gallons. New compressor equipment, dephlegmator and preheater were added to the Surety Gasoline Company's Huntington Beach plant, and further compressor apparatus is contemplated for the same plant shortly. The Union Oil Company of California reports the construction of two gasoline plants, the laying of 14½ miles of gas line and the building of eight 160 H. P. unit gas compressors during

(Continued on Page 28)

Carbon Monoxide Poisoning Investigations *in* Los Angeles Covered *in* Report

	Number Tested
Portable heaters, blue flame type	3
Portable heaters, yellow flame type	5
Radiant type heaters	13
Radiators, hot air	2
Radiators, gas-steam	5
Total	28

The tests conducted by this committee were made with both natural (1150 B. t. u.) and mixed (850 B. t. u.) gas in open ventilated rooms and in a closed chamber with both normal and excessive gas pressures. It was found that with appliances in good condition and carefully and accurately adjusted, carbon monoxide was not frequently produced in open ventilated rooms. On the other hand, when the same appliances were operated at excessive gas rates or in a closed chamber where the oxygen supply was not continually replenished, dangerous amounts of carbon monoxide were quickly produced. Oftentimes a study of the design or construction would fail to reveal the factors contributing to unsafe operation, which could only be learned by actual tests. Further, it was found that many appliances had objectionable features such as exposed needle valves for adjusting the gas flow. Adjustable valves should be entirely enclosed, or designed so as to require the use of a special screwdriver or other special tool for making adjustments. Over-supplying an appliance with gas is one of the most common causes of carbon monoxide production, and an uninformed person in adjusting a needle valve generally gives the appliance too much gas and thereby creates a serious hazard. In other cases, particularly with radiant type heaters, the manufacturers often fail to provide for the admission of sufficient secondary air around the burner heads and within the radiant elements.

A considerable portion of the sub-committee's report deals with tests and inspection of appliances made as a part of the investigations. The general conclusions to this section of the report are inserted at this point:

Conclusions from Appliance Tests

1. The liberation of carbon monoxide by gas heaters results primarily from one or more of four causes: (a) excessive gas consumption; (b) insufficient air for complete combustion; (c) faulty construction of burner; (d) contact of flames with cold objects, which cools the gases.

2. Out of 28 appliances investigated, 7, or 25 per cent, produced carbon monoxide during open-room tests. Of these 7 appliances, one was a blue flame heater, 2 were of the yellow flame type, 2 were hot air radiators, and 2 were radiant heaters.

(Continued from Page 17)

3. Percentages of carbon monoxide formed during open-room tests varied from 0.02 per cent to the extremely high figure of 3.8 per cent, which was noted in one case of an appliance using natural gas under 10-inch pressure.

4. Heaters seem to produce carbon monoxide more readily on natural gas than on mixed gas. Two appliances produced carbon monoxide with mixed gas and seven with natural gas. This is doubtless due to free hydrogen present in mixed gas (but absent in natural gas), which accelerates the rate of flame propagation, thereby assisting in obtaining complete combustion.

5. Blue flame heaters produce a serious hazard when operated with a gas consumption rate that causes impingement of the flame on cold objects or prevents sufficient supply of secondary air to reach the flame.

6. In order to be safe, yellow flame heaters must have a free burning flame without impingement on metal parts, and without interference between the individual flame jets.

7. Hot air radiators become hazardous when, through a desire to secure maximum efficiency, there is too great a restriction of secondary air to the burner, often caused by the appliance being constructed with too long a down pass.

8. Radiant heaters become dangerous when operated with excessive consumption of gas. Radiant heaters should not be operated so that their radiants will glow more than three-fourths of the way to their tops. It is also very important that the burners be clean and free from objects apt to interfere with normal flow of the gas and admission of an adequate supply of secondary air for proper combustion.

9. Gas-steam radiators, as investigated, were found by the tests herein reported to be quite safe, due primarily to the regulated flow of gas at very low hourly rates, short flames, adequate secondary air supply, and generally good burner arrangement.

10. Tests here reported indicate that the rate of carbon monoxide produced increases progressively as the percentage of oxygen in the surrounding air diminishes, until near the point at which the flame becomes extinguished it is usually formed very rapidly.

11. Percentages of carbon monoxide formed during closed-room tests at the point of extinction of the flame ranged from 0 to 0.36 per cent. Heaters supplied with ample quantities of secondary air, such as the better type of yellow flame heater and the gas-steam radiator, did not form carbon monoxide so readily as those in which the secondary air was more restricted.

The concluding portions of the general summary to the sub-committee's report follows:

Ventilation

The importance of adequate ventilation is at once appreciated when it is known that for each cubic foot of gas burned, from eight to 11 cubic feet of air are consumed. Ordinary gas heating appliances burn from 15 to 25 cubic feet of gas per hour; thus, on the basis of 20 cubic feet, 160 feet of air would be used. If no fresh air were admitted to the room, the normal oxygen content would be materially reduced and a condition would be created wherein even a perfectly designed appliance would tend to produce carbon monoxide.

A number of eastern cities and the Great Britain Board of Trade have during the past few years conducted investigations similar to this. In Baltimore very extensive studies, made under the direction of the public health authorities, indicated the dangers resulting from the lack of proper ventilation and the use of improperly designed gas appliances. The Baltimore investigation resulted in the adoption of an ordinance that provides for the sale and proper installation of gas equipment.

Adequate Regulation Needed

The results of the appliance test work conducted by the committee, together with the information that has been gathered regarding the cause of the numerous accidents in Los Angeles, have convinced this committee that the sale and installation of gas equipment should be regulated more fully than is provided for in the existing City Building Ordinance.

Western Gas in an early issue will present the sub-committee's recommendations as to ordinance proposals for regulating the sale and installation of gas equipment in Los Angeles.

Increasing Load Cuts Service Charges *for* Salt Lake City Gas Users

By George R. Horning

Vice President and General Manager, Utah Gas and Coke Company

Appreciating the fact that no permanent advance is possible save through increased service to consumers the Utah Gas and Coke Company is well launched on a program of lessening costs to its patrons. Four voluntary reductions in rates have been declared in the past year, made possible through increase in volume of gas sold. In the accompanying article Geo. R. Horning, vice-president and general manager of the Company, has some important observations to make on the problem of building gas sales.

IF the rights of the public are properly taken care of in reducing lower costs and steadily improving service, the rights of stockholders will take care of themselves," said Samuel Insull, chairman of the Utah Gas and Coke Company's board of directors at a recent board meeting. In the opinon the writer there is too wide a spread between the cost of gas at the plant and the amount charged the customer—a condition more or less comomn to gas companies generally, and the Utah Gas and Coke Company is exerting every effort to take care of its consumers' interests by shortening this gap between cost and charge.

Increasing Sale of Gas

In Salt Lake volume sent out furnishes one means of reducing the cost to the consumer. Hence, during the past year this company decided to increase its sale of gas. The question was—how? In our case the gas furnace, water heating and to a certain extent new industrial uses open the way.

But a few years ago the gas industry was told by engineers that it could not hope to do a house heating business, and yet I think it realizes today that whether it wants to heat houses or not it is going to be compelled to do so.

When the industry, about the time that the electric man started to take our illuminating business, discovered that its product could be used for cooking purposes, there were just as many doubting Thomases on the subject of cooking with gas as there are now on the subject of materially increasing the gas business by going after fuel uses not now served by our industry. Considerations for such opposition at that time probably had just as little basis in fact as has opposition to an enlarged program for the industry at the present time.

Our first house heating installation was made a little more than two years ago. Since then nearly 100 gas-fired furnaces have been placed. Care and attention has been given in each case to insure satisfied users and as a result the field is ripe for harvesting.

There are just two things, it seems to me, in which the customer has to be educated to make gas heating a very desirable business. One of these is to educate him to the advisability, so far as his own pocketbook is concerned, of reducing his demand to the minimum. The second is to educate him to the value of paying more for gas considered simply as a fuel as compared with coal considered likewise. This is really the first thing you have to do, and once done, the probabilities are that if he can at all afford the price he would not go back to a solid fuel.

With the class of people who cannot afford the outlay for a gas heating installation or the operating cost, there is a large field in supplying hot water in the summer time when they have no other means of getting it. Why not cultivate this field? It is more easily filled than the gas heating field and presents probably, as far as the possible total is concerned, nearly as great a field as does house heating. Cultivation of this field will certainly provide an offset to the winter sendout occasioned by heating.

The largest essential on any of these jobs, whether they be house heating, water heating, or industrial, is to limit the demand and get paid for all of the demand which the customer places on the lines, thereby making it possible to pay interest on the cost of the installation which he has made necessary. When his demand is limited and he is made to pay for that which he occasions, a desirable load factor and desirable business results.

Rapid Expansion

Eight hundred last year. Three thousand this year. This expresses in new customers the growth of the Utah Gas & Coke Company. During 1925, four voluntary reductions were made in rates. A progressive policy of expansion has been in operation during the year and it has produced results. Extensive advertising and publicity, radio programs, home service work and a comprehensive program of public relations have contributed materially in stimulating expansion. If the past year's growth can be maintained, the desirable load factor, the desirable business and further reductions will soon be attained.

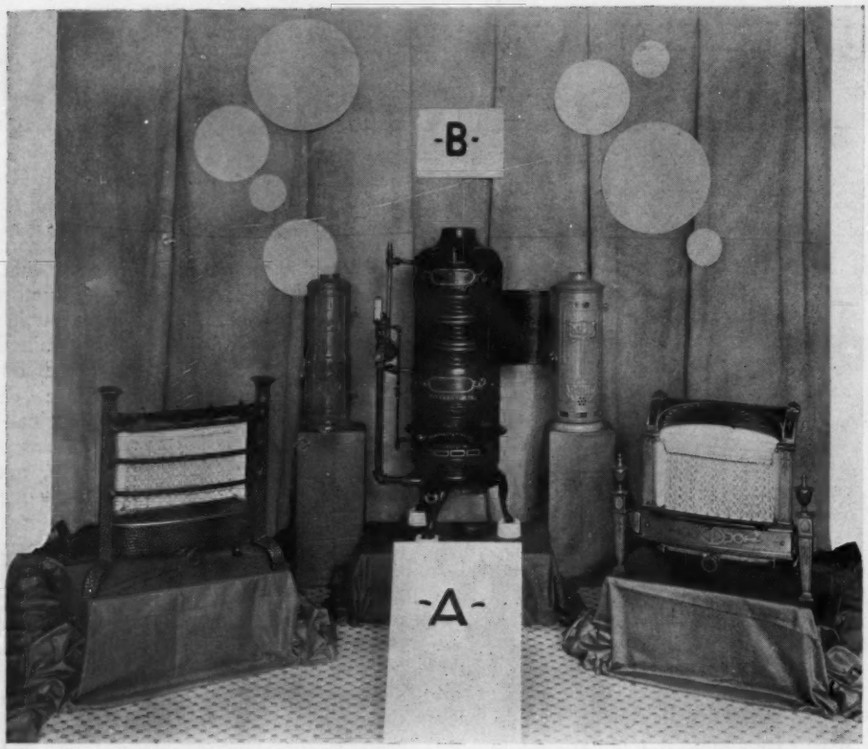
Heretofore our efforts were devoted principally to the problems of gas manufacture, gas distribution, and gas utilization, and from a strictly mechanical viewpoint every effort was made to produce the most economical as well as most convenient fuel known to science. Our job of perfecting every phase of the business beginning with the raw material and ending with the customer's bill for gas was well done. However, we have come to realize that these problems are only part of the job. And so the scope of activity has been broadened to give emphasis to the vital factor of public relaitons. Our greatest asset is the friendly attitude of the people of the community which we serve. As Schwab, the captain of the steel industry, has said, "It is not enough to do a job well, but it is even better to tell the public how well you have done it."

The Home Service Manual

(Continued from Page 23)

tary to sell these at cost to members of the Association. This edition will be labeled "Tentative" and will have a stiff paper cover. The type will be held and if there appears to be a demand for further copies, a second edition will be printed. Before this second edition is ordered, a conference will be called for the purpose of amending or changing its contents in any way our members may then think desirable.

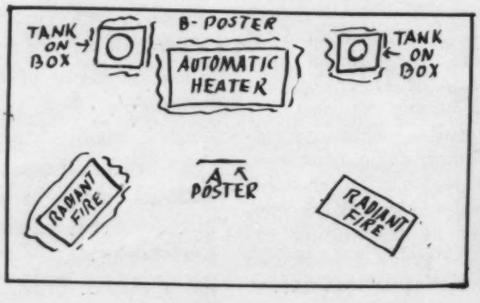
The cost to the Association of the first edition will be about 90 cents per copy and the price to members will be made only sufficiently higher to cover mailing and such other incidental costs as may develop. Orders for copies will be filled in the sequence of their receipt at the Secretary's office, and as the edition is limited, members are advised to place their orders at once. A copy of the Manual should be placed in the hands of every fitter, salesman and department head in the employ of gas companies and gas appliance firms. Order now!



A Window Display *for* Radiant Types *and* Water Heaters

THE busy rush of holiday trade just closed has served to emphasize the value of strong window appeals in gas appliance merchandising. However, the window display is not a seasonal device in any sense of the word, except as it reflects each season in its message. Displays that capitalize upon a holiday are of timely value, and should figure in the advertising program of every dealer, but there are many approved forms of arrangement for standard equipment that will be found effective when the holidays are past and the dealer has exhausted his store of display ideas. *Western Gas* is presenting typical window ideas such as the above in each issue.

This month is shown a window display for radiant type heaters and water heaters. Simplicity is the key-note of the window in the accompanying illustration, and the arrangement has been found to be as effective as it is simple and inexpensive. Directions for reproducing the display are as follows:



The background may be draped as shown in the illustration, or may be left undraped, if the present window background provides an adequate setting for contrast with the cardboard circles used. These color spots serve to guide the eye in to the merchandise. They are of cardboard, three 12-inch circles in light blue, two 18-inch in yellow and three six-inch in light green. If a background is necessary, use sateen or Japanese crepe in tan or light grey.

Place the automatic water heater against the background in the center, using a grocery box not over 12 inches high as a pedestal. Place the tank heaters on similar boxes on each side of the automatic heater. The radiant type heaters should be set on boxes about 18 inches high, approximately 15 inches from the front of the glass, at an angle of 45 degrees, facing inward. Cover the boxes with the same color as the background.

Linoleum may be used for flooring, though other types such as rug, carpet, or inlaid flooring will serve. Posters A and B, to carry sales messages, should be placed as shown, one over the automatic heater in the center of the background, one six inches from the glass, in the center of the window.

Reproducing the window described above will be found to be an easy matter from a labor and materials standpoint, and the cost is estimated at about $3.50, depending upon the goods selected for the drapes.

WESTERN GAS will appreciate receiving photographs of any window reproductions of the above display which are used by our readers.

West Plays Host *to* A. P. I. *and* N. G. M. Association

(Continued from Page 15)

the Lomita Gasoline Company of California.

The program as given above suggests some significant offerings in store for natural gasoline men, and the general sessions of Tuesday will also be of decided interest. Group 3, which deals with the general topic: Uniform Methods for Oil Accounting, will hear a presentation of papers on chart of accounts for various operating departments of oil companies, one of the papers being on casinghead gas department accounting.

Special entertainment committees under the direction of E. W. Clark, executive vice-president of the Union Oil Company of California, are completing their preparations, and it appears that the Los Angeles convention will be long remembered in the annals of the Institute. Visiting ladies will find a competent reception committee ready to serve them. An informal reception and smoker will be held at 8 o'clock Monday evening, January 18, at the Biltmore. For Friday, January 22, is scheduled an extensive trip through Southern California fields and a golf tournament is also arranged for Friday. A dance in the ballroom of the Biltmore, Friday evening, will place the final touch to a full entertainment program.

Natural Gasoline Industry Shows 1925 Growth

(Continued from Page 25)

last year. The Union also anticipates increasing its low pressure gas handling facilities in the near future.

On another page of this issue will be found a comprehensive list of natural gasoline plants in California and Wyoming, compiled from returns to the *Western Gas* questionnaire and other sources. The list gives plant location, type, capacity, status as to operating or shut down, and in some cases the plant superintendent's name is given.

CLYDE H. POTTER IN AD CLUB PUBLICITY POST

Clyde H. Potter, publicity director for the Southern Counties Gas Company, has recently become vice-chairman of the "Blue Pencil" committee of the Advertising Club of Los Angeles. The Blue Pencil is the Club's official journal, and is an exceedingly interesting bulletin.

BEN C. DUMM CALIFORNIA MANAGER FOR BESSEMER

The Bessemer Gas Engine Company has announced the appointment of Ben C. Dumm as its California manager. The office of the Company is at 2145 Sacramento St., Los Angeles, Calif. In addition to this direct factory representation the Bessemer Gas Engine Company is represented in California by the Associated Supply Company, in whose numerous stores Bessemer engines and parts are stocked.

SOCIETY OF GAS LIGHTING ELECTS OFFICERS

The 50th annual meeting of the Society of Gas Lighting was held at the Hotel Astor, New York, Thursday, December 10th. The following officers were elected: President, Dr. A. C. Humphreys; Vice-President, Wm. Cullen Morris; Treasurer, Wm. J. Welsh; Secretary, Geo. G. Ramsdell.

LOS ANGELES BURNER MFGR. FILLS TEXAS ORDERS

The Lee B. Mettler Co., 406 South Main, Los Angeles, among other large orders for their gas burners filled orders the past month for the Imperial Sugar Co., of Sugarland and Port Neiches, Texas, and for the Humble Oil & Refining Co., at Baytown, near Houston, Texas.

VENTURA COMPRESSOR PLANT LARGEST ON COAST

What is probably the largest assembly of compressor equipment on the Coast is that being completed by the Southern Counties Gas Company at Ventura, Calif. When complete, about the first of the year, the plant will consist of 27 primary units, 23 of which are now in operation. The Ventura plant has a discharge pressure of 450 pounds, perhaps the highest pressure used in California.

There are 25 twin units in the plant, consisting of 15 four-cycle Clark gas driven compressors of 175 h. p., nine 170 h. p. four-cycle Cooper compressors and one 165 h. p. two-cycle Clark. There are also two 80 h. p. single cylinder Bessemers and three 60 h. p. two-cycle Clark auxiliary engines included in the equipment.

At the Santa Paula compressor station of the Southern Counties there are two 170 h. p. four-cycle Coopers. Completion for this station is also due about the first of the year.

L. A. G. & E. MAKES LARGEST METER SET-UP

What is the largest meter set-up ever made by the Los Angeles Gas and Electric Corporation to date is that in the new Elks' Club at Sixth and Park View Streets, Los Angeles. The installation consists of a battery of six huge gas meters, each of 100-light capacity. Each has a maximum capacity of 1800 cu. ft. of gas per hour. House piping supplying the gas is eight inches in diameter, which is the equivalent of some 520 three-fourths inch ordinary house pipes. The average residence meter has a 150 cu. ft. per hour capacity. The installation will serve the restaurant and grill demands of the Club and will also fire two boilers, each of 250 h. p. capacity.

Demonstration Kitchen at Coker and Taylor's, Glendale, Calif., showing Thanksgiving Dinner prepared for needy families of Glendale. The Demonstrator is Jessie M. Shannessy

Glendale Firm Gives Dinner *for* Poor *as* Demonstration Feature

THANKSGIVING, 1925, provided Coker and Taylor, progressive gas appliance dealers of Glendale, California, with a unique opportunity to put over some unusual publicity and at the same time to make a contribution to the spirit of the season. Each Wednesday afternoon it is the practice at Coker and Taylor's to conduct a well advertised and well organized cooking demonstration, and on the Wednesday of the week preceding Thanksgiving this event was made to serve a double purpose. A full course Thanksgiving dinner of the best "Turkey" variety was prepared, and contrary to the usual custom, no samples of the cookery were distributed among the 150 housewives who were in attendance. The entire dinner, consisting of 12-pound turkey, candied sweet potatoes, baked squash, baked onions, cranberries, celery and pumpkin pie, was turned over to the Salvation Army unit of Glendale to be given to the poor of that city.

"A Dinner for the Poor" was effective advertising copy, and was played up in the local newspapers to good effect. A radio announcement of the demonstration at Coker and Taylor's was also made from a Glendale broadcasting station, and the capacity turnout resulting from this publicity gave the firm's salesmen some live prospects to work with.

According to Donald B. Jones, Coker and Taylor representative in charge of gas appliance sales, the consideration for the needy families of Glendale displayed in the Thanksgiving demonstration proved an excellent seasonal tie-up—so good a tie-up, in fact, that it was deemed worth while to attempt a Christmas demonstration. The Christmas effort, however, was conducted along somewhat different lines.

Ordinary demonstrations at Coker and Taylor's are held in a section of the store especially fitted out with a raised platform, as shown in the illustration of the Thanksgiving dinner above, and provided with seating arrangements, but the Christmas demonstration was held in one of the store windows, being visible both from interior and exterior of the store. While Jessie M. Shannessy, the firm's efficient demonstrator, conducted the demonstration and spoke to the women grouped inside the store, an assistant faced the crowd outside and turned a series of cards containing the message which was being given verbally inside—so that the demonstration could be viewed intelligently to those who could not hear the explanations given.

Christmas cakes and baked Christmas confections—especially evolved for preparation in an oven—were featured in this window demonstration, and to each purchaser of a range, providing purchase was made during the day of the demonstration, was given one of the done-to-a-turn cakes prepared.

First Session *of* Gas Appliance Course Will Convene January 12

Walter M. Berry and W. M. Henderson to Deliver Lectures at Opening Meetings — Subjects and Treatment Suggested

THE first lecture of the educational course on the sale, use and selection of gas appliances to be given by the extension division of the University of California for members of the Gas Appliance Association of Southern California, will be given on Tuesday evening, January 12, in the auditorium of the Los Angeles Gas & Electric Corporation.

Walter M. Berry

W. M. Henderson

Walter M. Berry, executive engineer of the California Gas Research Council, who is in general charge of the course will open the series of lectures by a brief historical sketch of the early development of the gas industry, the growth of the gas business in the United States and abroad, and the changes that have taken place in the gas manufacturing processes in California since the first plant was started in San Francisco in 1852 by Peter Donohue. The present gas manufacturing methods used in Los Angeles will be described and the sources and characteristics of the natural gas on which the city is largely dependent at the present time will be discussed.

A sufficient and uniform pressure of gas is recognized by appliance men to be as important a factor in good gas service as uniform composition and heating value. Those enrolled in the course, therefore, will find considerable interest in the remarks of W. M. Henderson, superintendent of distribution of the Los Angeles Gas & Electric Company, who at the January 12 meeting will give the appliance men some conception of the magnitude of the task of supplying over one hundred million cubic feet of gas per day to the consumers. Mr. Henderson will describe some of the difficulties and special problems that are peculiar to the local conditions on account of the large variations in load conditions caused by the enormous heating business.

The other lectures, to be delivered by men prominent in the industry, will follow in the order announced in the December issue of this journal.

The following facts to be presented in Mr. Berry's first lecture will convince his student auditors that they are working in an industry which serves a very vital need of the community and is worthy of their best efforts. Concerning the energy output of the gas industry in California, Mr. Berry's paper makes the following statement:

"We sometimes hear of electrical competition in the gas business, and it is interesting to make some comparisons on the basis of total energy output in the two industries. In 1924 the total sales of electrical energy in California were 3,976,799,100 kilowatt hours. Assuming that the average heating value of the gas in the State is about 900 B. t. u. (including natural gas) it would require about 3.8 cubic feet of gas to equal one kilowatt hour, and the total energy in the gas sold in 1924 would be 39 billion kilowatt hours or about ten times as much as the total electrical energy sold. The popular belief that some day we shall have an abundance of cheap electrical energy for all of our needs is therefore a Utopian dream, perhaps never to be realized. It is true that electrical heat is now being used for some purposes where it would appear that energy in the form of gas or other fuel could be supplied with greater efficiency; however this condition is partly due to unscientific rate structures which do not accurately place the cost of service where it belongs."

BONUS TO SOUTHERN CALIF. GAS COMPANY EMPLOYEES

The 12th monthly bonus for the year 1925 was paid to Southern California Gas Company employees in December, some 2000 employees who have been with the Company seven months or longer receiving bonuses. During the year the total paid out in this manner has come to $113,662.07, representing approximately 10 per cent of the employees' pay in this period.

GAS RANGE DIRECTORY IS ISSUED IN SAN FRANCISCO

Henry Bostwick, manager of the San Francisco division of the Pacific Gas and Electric Company, has announced the issue of a retail directory of all gas ranges sold in that city. The directory is to be distributed to the public as a buying aid. Dealers have been requested for listings of the water heating and heating appliances they handle, in order that similar directories for these appliances may be prepared.

HENRY OBERMEYER LEAVES A. G. A. FOR ADVERTISING POST

Henry Obermeyer, editor of the American Gas Association Monthly, leaves the Association on January 15 to take up work in the advertising department of the Consolidated Gas Company of New York. His place will be taken by Howard F. Weeks, associate editor of the Gas Age-Record, New York City.

LEE HOLTZ NOW ASST. SUPT. OF DISTRIBUTION

Lee Holtz has been appointed assistant superintendent of distribution for the Southern California Gas Company, his promition following a five year connection with the company. Previous to his coming to California, he had wide experience in the natural gas industry of the middle west, principally in Kansas. Before assuming his duties as assistant to C. D. Bell, superintendent of distribution for the Southern California Gas Company, Mr. Holtz was in charge of the combustion engineering work for that company.

PACIFIC GASOLINE CORP. MOVES TO LONG BEACH

Headquarters of the Pacific Gasoline Corporation, natural gasoline operators, have been moved from Los Angeles to Long Beach. New compressor equipment has recently been added to the corporation's Signal Hill absorption plant, consisting of two 165 H. P. Clarks.

OPEN HOUSE FOR PATRONS OF SALT LAKE CITY COMPANY

The Women's Information Committee of the Utah Gas and Coke Company, Salt Lake City, held an "open house" on December 10 for several hundred of the Company's most recently acquired women customers, the program including music, refreshments, and a demonstration on how to make Christmas candies.

H. H. JONES ASSUMES GENERAL MANAGERSHIP AT STOCKTON

On December 1st, H. H. Jones, new general manager for the Western States Gas and Electric Company, and successor to Samuel Kahn, who was made vice-president and general manager of the Market Street Railway Company when that utility recently became a Byllesby unit, assumed his duties at Stockton, Calif. Mr. Jones comes to California from Minneapolis, where for the past year he has been vice-president in charge of operations of the Northern States Power Company for the Byllesby corporation.

Mr. Jones' previous experience includes a 14-year period of managership of the San Diego Consolidated Gas and Electric Company.

GRISCOM-RUSSELL APPOINTS AGENTS FOR G-R PRODUCTS

The Griscom-Russell Company has just appointed the Thomas Machinery Company, 622 American Bank Building, Los Angeles, Calif., as their Pacific Coast agents for G-R products designed for the petroleum producing and refining field only.

Chas. C. Moore & Co. will continue to handle the sale of all Griscom-Russell products to all Pacific Coast trade excepting oil refining and producing companies.

1926 PRESIDENT OF EMPLOYEES' ASSOCIATION AT SAN DIEGO

J. A. Harritt, superintendent of gas production for the San Diego Consolidated Gas and Electric Company, has been chosen to serve as president for the Employees' Association of the company for the coming year.

ATLANTIC CITY TO BE 1926 A. G. A. CONVENTION SITE

Atlantic City will be headquarters for the American Gas Association convention again in 1926, by recent announcement. Dates for the convention are to be October 11 to 15.

SOUTHERN COUNTIES TO ISSUE $2,500,000 IN BONDS

The Southern Counties Gas Company of California has been authorized by the Railroad Commission to issue and sell at not less than 96 per cent of face value, plus accrued interest, $2,500,000 of its 20 year, six per cent, general and refunding mortgage bonds.

FUNERAL AID PLAN OPERATIVE IN VANCOUVER COMPANY

A plan for funeral aid, in which every employee under 55 years of age at time of application may participate, is proving very beneficial in the British Columbia Electric Railway Company of Vancouver, B. C. The primary aim of the organization is to provide members with ready funds in the time of special need which is occasioned by death. Fee for membership up to the age of 40 is $1.25; for 41 to 55 is $2.50. Each member pays in $1.00 upon the death of a member, the beneficiary of the deceased receiving the sum equivalent to $1.00 a member. A contingency reserve fund is maintained, for which members pay in $1.00 a year. Employees may retain membership after leaving the Company.

THREE CLASSIFICATIONS FOR CALIFORNIA GAS COMPANIES

The Railroad Commission of California has issued an order classifying gas and electric corporations into three classifications and requiring them to keep their accounts in accordance with the Commission's uniform system of accounts. The utilities having annual revenues of over $250,000 are classified as Class "A", those having revenues of from $50,000 to $250,000 per year are placed in Class "B", and those of less than $50,000 annual revenue are designated as Class "C".

NEW ORCHESTRA FORMED BY L. A. G. AND E. WORKERS

Employee-musicians from the Los Angeles Gas and Electric Corporation's 7th and Channing St. shops and offices have launched a new orchestra and are recruiting qualified applicants. First public appearance of the new organization will probably be made at the employee scoial gathering of January 8.

GAS CONSERVATION SCHOOL POSSIBLE IN OKLAHOMA

A gas conservation and efficiency school to be conducted similarly to the gas metermen's school, which is held at the University of Oklahoma at Norman, may result from the appointment of a committee of the Oklahoma Utilities Association authorized at the gas conference of the Association, held at Tulsa. This committee is to confer with officials of the Bureau of Mines at Bartlesville and report later on the advisability of establishing such a school, to be held each year at Bartlesville.

FIFTH ANNUAL SHORT COURSE FOR GAS METERMEN

From December 8 to 11, inclusive, the fifth annual short course for gas metermen was given at Iowa State College, Ames, Iowa. The program was prepared by the Iowa District Gas Association. Last year 141 men from 15 states registered for the course.

Portland Gas & Coke Company's Exhibit of Humphrey Radiantfire Original Oil Paintings

Using Art *to* Boost Sales---Original Oil Paintings Exhibited

ONE of the most unusual and interesting sales-boosting campaigns seen on the Pacific Coast is a plan now in use by leading Humphrey Radiant-fire dealers throughout the coast territory, which features a comprehensive exhibit of original oil paintings from the brush of George C. Harper, nationally known artist of Detroit, Michigan. Thirteen oil paintings, representing a substantial part of a recent national advertising campaign for the Humphrey Radiantfire in such mediums as the Saturday Evening Post, are included in the Pacific Coast exhibit. All of these paintings were reproduced in national advertising mediums, and hence many of the subjects are already familiar to many magazine readers in the coast section.

The art exhibit, as it is used to boost Radiantfire sales, is displayed by local dealers according to this general plan: A series of newspaper announcements of the art exhibit, especially prepared for use of Radiantfire dealers, is run in local newspapers just prior to the opening of the exhibit. These announcements describe the nature of the art exhibit, and extend a general invitation to the public to come to the dealer's store to see the paintings. They also announce that in connection with this exhibit, which, of course, is entirely free, the local dealer is making a special sales offer. This offer is that any model of the Radiantfire will be installed for a first payment of one dollar. The offer is good only while the art exhibit is up (usually about one week). In addition to the newspaper advertising, special window displays on the exhibit are installed, which also invite passers-by to enter and view it.

The paintings are arranged on separate easels in the dealer's showrooms, and grouped about them are various models of the Humphrey Radiantfire. Smaller cards telling of the special offer are conspicuously displayed, and salesmen are instructed to mention the offer to all with whom they come in contact during the exhibit.

This plan, which is unique in sales drives, has been unusually successful in boosting sales wherever the exhibit has appeared. The newspaper announcements and the window displays serve to attract many people into the dealer's store, and thus to draw their attention while in a receptive mood, to the special offer.

The Portland Gas and Coke Company, Portland, Oregon, was the first dealer to use the exhibit, which was on display in the showrooms of this Company during the latter part of September. The exhibit was then used by dealers in San Francisco, Oakland, Los Angeles, Long Beach, San Diego, and is to be used also in Sacramento and San Jose. The sales drives last about one week in each locality.

George C. Harper, the artist for these paintings, is one of the country's leading commercial artists. He has studied at the Cleveland School of Art and at the Art Student's League of New York. In addition to his work with the Humphrey Radiantfire, he has done much for such products as Buick and Chevrolet. Mr. Harper has also exhibited at the Institute of Arts in Detroit.

GAS APPLIANCE SOCIETY

A Department Conducted by F. U. Naylor, Secretary

THE Executive Committee of the Gas Appliance Society of California held a meeting December 9 at the Lick Gill, San Francisco. Plans for the 1926 Gas Appliance Exhibit were approved. Al Crane, who will again act as managing director, is already at work on the preparation of materials. The membership will receive detailed plans at an early date.

San Francisco Unit

The baby member of the local unit is the Johnson Warm Air Heater Company of Sacramento, which has recently opened up an agency at 295 Ellis Street with Mr. Daly as manager. The company's heater is a new departure in gas heating and is especially adapted for small homes.

L. T. Williams will open up "The Spark Stove Shop" at 19th and Mission Street about the first of the year. Mr. Williams was formerly with Lachman Bros.

J. B. Cahill, formerly of Jackson's in Oakland, is the new manager of Lachman Bros'., San Francisco Stove Department.

Barney Pedersen of Geo. M. Clark and Company is back at his desk. Mr. Pedersen was in an automobile accident early in the fall and is just now recovering.

The society will have to face another ordinance problem in the near future. Hunter & Hudson, engineers, and J. J. Rosedale, safety engineer, have been working on ordinances, unknown to each other. The local unit will, however, be given the opportunity to make recommendations before the finished article goes to the council.

East Bay Unit

The Range Bureau of the East Bay Unit has successfully launched a uniform appraisal sheet for second-hand stoves. The plan is patterned after a form in use by the Automobile Dealers' Association which has brought very satisfactory results. Approximately 75 per cent of the membership engaged in the gas range business have signed and it is hoped that a stabilizing effect on trade-in appliances will result thereby.

Robert Howden & Sons, local distributors for the Humphrey Radiantfire, are at last getting settled in their artistic and excellently arranged new display rooms, located at the corner of Webster and 17th. The interior arrangement of patio and fountain and beautiful Moorish tile decorations has given a fitting background for displaying the high quality type of gas appliances sold by this firm.

Another society member has also reached that sphere of opulence which permits of establishing oneself under one's own rooftree. The Potter Radiator Corporation has just completed a new home, and Sam Terry, sales manager, is busily engaged in moving in and arranging his wares. The new address of 51st and Broadway sounds like New York.

Some constructive work is being contemplated by the Heating Bureau in the form of an ordinance for the City of Berkeley covering the installation of gas-fired warm air furnaces. This department of the society has been particularly active during the past year and Sam Terry, its chairman, is to be congratulated in originating ideas, such as the uniform proposal blanks for Warm Air Furnace Contractors and the Credit Exchange Department.

P. G. & E. Acquires Sacramento Co.

THE Pacific Gas and Electric Company has announced that it has purchased the Sacramento Gas Company from E. H. Rollins & Sons, San Francisco bankers. The purchase was made subject to approval by the State Railroad Commission.

Rollins and Sons acquired the Sacramento Gas Company a few weeks ago when they bought the stock of the Company from local bankers and investors.

The Sacramento Company distributes gas both in Sacramento and in Lodi. Part of its product is manufactured and part is produced by natural gas wells. It owns a distribution system of 109 miles in Sacramento and supplies more than 8500 consumers.

Frank A. Leach, Jr., vice-president and general manager of the Pacific Gas and Electric Company, announced that the rates of the Sacramento Company will be put in effect throughout Sacramento. Mr. Leach said:

"The rates of the Sacramento Company are somewhat lower than the rates now charged by the Pacific Company. Putting the Sacramento rates in effect on our system will mean a reduction of $30,000 a year to our gas consumers in Sacramento.

"This reduction will be the third reduction in gas rates made by the Pacific Gas and Electric Company in Sacramento in the last three months. The three reductions mean a saving of $120,000 a year to gas consumers.

"We expect to spend considerable money in uniting the plants of the two companies and to make ready for gowth and expansion. Our investment in new gas plant this year has been about a half million dollars. We have almost as large a budget under preparation for 1926."

Mr. Leach declined to state what price was paid for the property but it was announced some weeks ago when the sale was made to Rollins & Sons that it was based on a valuation of $1,468,844.00.

STOCKTON COMPANY TO ENTER APPLIANCE FIELD

The Western States Gas and Electric Company, with headquarters at Stockton, Calif., is completing plans to actively enter the appliance merchandising business. A corner store location adjoining the Stockton offices of the company will provide facilities for the new sales department in Stockton, and the establishment of branch stores in Eureka and Richmond, Calif., is under consideration. Appliance sales will be in charge of H. K. Griffin, commercial agent for the company.

WESTERN BUILDING PERMITS SHOW INCREASE

Building permits for the month of November, 1925, compared with those of November, 1924, for the western states, as reported by the F. W. Dodge Corporation, show increases as follows: Arizona, $32,145; Idaho, $22,469; New Mexico, $9,575; Oregon, $1,002,855; Utah, $484, 741; Wyoming, $25,250.

PHILLIPS PETROLEUM ERECTING PLANT AT ARTESIA, N. M.

Construction on a casinghead gasoline plant, cost of which is estimated at $600,000, is to begin shortly at Artesia, New Mexico, by announcement of the Phillips Petroleum Company of Bartlesville, Okla. The plant will be located on Section 17-18-28. M. T. Kirk has charge of the erection of the plant, and J. C. Albright is to be plant superintendent when construction is complete.

PERMITS GRANTED TO BURN NATURAL GAS

The railroad commission of Texas has granted permission to three companies in Stephen County, Texas, to burn an aggregate of 24,000,000 cu. ft. of gas from wells in that county for manufacture of carbon black, it has been announced at Austin. The permits, which are valid for four years, provide that gas shall be diverted from the carbon black plants at any time that domestic or industrial demands develop.

26 PLANTS FOR PACIFIC GASOLINE COMPANY

Pacific Gasoline Company placed its 26th natural gasoline plant in operation Sunday, December 20th, when construction work on Inglewood No. 2 was completed. This plant is located on the Baldwin lease of the Pacific Oil Company and has a capacity for treating 3,000,000 cubic feet of gas daily. This makes the 14th plant to be built in Los Angeles, Orange and Ventura Counties.

COURT SETS RULE ON SERVICE OF GAS IN RURAL SECTIONS

The Oklahoma Supreme Court, in the case of the Oklahoma Natural Gas Company vs. Vance et al, held that the corporation commission has no authority to require a public utility to furnish natural gas to people living outside the city limits where the utility has never professed or undertaken to serve the people of that community generally, even though it may appear that the gas company has a pipe line in close proximity to the property of such persons.

NATURAL GAS PIPED IN COLORADO FOR FIRST TIME

Natural gas from Wellington dome, northern Colorado, has been turned into the 14-mile pipe line from the field to Fort Collins. This will be the first time natural gas has been used for domestic purposes in Colorado. The line was laid by the Colorado Public Service Company and the gas will be marketed by the Poudre Valley Gas Company, both subsidaries of Cities Service Company.

ARIZONA OIL LANDS RESTORED TO ENTRY BY INTERIOR DEPT.

During the month of November, 1925, according to a summary made by the Interior Department through the Geological Survey, nearly 140,000 acres of land in Arizona previously included in oil withdrawal were restored to entry. A little more than 20,000 acres in New Mexico were defined as within the known geologic structure of producing oil and gas fields under the act of February 25, 1920.

P. G. AND E. APPLIES FOR LARGE BOND ISSUE PERMIT

Pacific Gas & Electric Company has applied to the Railroad Commission of California for permission to issue and sell 50,000 shares of common capital stock at $100 per share, to use the proceeds to reimburse its treasury and to finance uncapitalized expenditures amounting to $26,875,925.74.

NEW COMPRESSOR UNITS FOR DOMINGUEZ PLANT

Eight 165 h. p. Clark compressors have been added to the equipment of the Union Oil Company's absorption plant at the Dominguez fields.

CONTRACTS FOR 12,000,000 CU. FT OF NATURAL GAS DAILY

Houston Pipe Line Company, a subsidiary of the Houston Oil Company, has contracted with the Humble Oil Company for 12,000,000 cu. ft. of natural gas a day.

INGLEWOOD BOOSTER PLANT FOR STANDARD OIL COMPANY

The Standard Oil Company has recently completed a booster plant on the East side property at Huntington Beach. This new plant will result in the conservation and treatment of considerable gas, which has heretofore been going to waste.

PLANT NO. 2 AT INGLEWOOD FOR PACIFIC GASOLINE

Plant No. 2, located on the Baldwin Lease of the Pacific Oil Company, has been hastened to completion by the Pacific Gasoline Company and began operation about December 20. Eleven wells on the Baldwin lease are supplying gas. The plant is of 4,000,000 cu. ft. daily capacity.

COLORADO GASSER DRILLED IN BY TEXAS COMPANY

The Texas Company encountered a gas flow of 60,000,000 cubic feet a day in a wildcat on Rangely dome, western Colorado, in the Frontier (Wall Creek) sand, at 3,001 feet. Pressure blew out the tools, wrecking the control valve and allowing the well to run wild.

NEW SPECIFICATIONS FOR NATURAL GASOLINE

The Association of Natural Gasoline Manufacturers has revised specifications to eliminate a conflict in color. The old specifications read—"color must be water white plus 25 Saybolt chronometer"; the new reads—"color of all products must be plus 25 Saybolt chronometer."

GAS AND OIL ENCOUNTERED IN UTAH WILDCAT WELL

The Midwest Refining Company, drilling a wildcat well jointly with Utah Southern Oil Company 12 miles south of Moab, Utah, encountered oil and gas at 2,028 feet. The well blow in unexpectedly and caught fire. When the fire was extinguished the well flowed by heads at 20 to 40-minute intervals, making around 150 barrels of oil with little water and 2,000,000 cubic feet of gas.

1924 NATURAL GAS OUTPUT ESTABLISHES RECORD

Total consumption of natural gas in 1924 amounted to 1,141,482,000 cubic feet, the highest on record, the Bureau of Mines has announced. This is an increase of 13 per cent over 1923. The value of the natural gas at the wells was estimated to be $105,779,000 and at points of consumption $253,830,000. Oklahoma led all the States with a production of 214,452,000,000 cubic feet. California second with 189,692,000,000 and West Virginia third with 182,285,000,000 cubic feet, the report indicated.

VENTURA CAMP NOW UNDER CONSTRUCTION

Pacific Gasoline Company is constructing a camp near its Ventura Plant No. 2, the equipment to consist of a combination office and warehouse building, a cookhouse, two bunkhouses, and a garage.

NATURAL GAS GASOLINE OPERATIONS

Compiled by J. W. MASHAW

Department of Commerce, Bureau of Mines, Division of Mineral Resources and Statistics

ONE HUNDRED AND FORTY-FOUR natural-gas gasoline plants, with a daily indicated capacity of 1,056,542 thousand cubic feet, of a total of 148 plants operating in California in November report a recovery of 28,211,006 gallons of natural-gas gasoline from 21,132,645 thousand cubic feet of gas treated. Ten natural gas gasoline plants report as being shut down this month.

Utilization of natural-gas gasoline amounted to 688,465 barrels, a decrease under October of 25,031 barrels.

Stocks of natural-gas gasoline at the end of November amounted to 59,053 barrels of which 21,922 barrels were reported by natural-gas gasoline plant operators and 37,131 barrels by refinery operators. This is a decrease of 15,796 barrels under October stocks

The production of gasoline during the month of November amounted to 152,777,560 gallons, a daily average of 5,092,585 gallons. This is a decrease of 6,703,939 gallons or 4.20 per cent under October output. Of this production 303,503 gallons were reported as finished gasoline produced by natural-gas gasoline plant operators. Compared to the production in November, 1924, an increase of 58,717,934 gallons or 62.43 per cent is noted. Of the gasoline produced 297,475 gallons were from using either a cracking or synthetic process and 152,480,085 gallons from other processes.

Stocks of gasoline show an increase of 1,574,843 gallons during November and at the end of the month amounted to 397,116,327 gallons. This stock figure includes 24,463 gallons of finished gasoline reported by natural-gas gasoline plant operators.

Natural gas gasoline blended at California refineries during November amounted to 449,923 barrels. The October total was 380,465 barrels.

NATURAL-GAS GASOLINE PRODUCTION AND DISTRIBUTION FOR CALIFORNIA

November, 1925

Type of Plant	*Gas Treated Thousand Cu. Ft.*	*Natural-Gas Gasoline Produced Gallons*	*Gasoline Recovery. MCF Gas Treated*
Oil Absorption	11,267,895	14,027,072	1.245 Gal.
Compressor	300,898	463,322	1.540 "
Combination Compressor and Oil Absorption	7,224,478	10,081,902	1.395 "
Combination Oil and Charcoal Absorption	2,339,374	3,621,330	1.548 "
Drip	.....	17,380	..... "
TOTALS	21,132,645	28,211,006	1.335 "
Natural-Gas Gasoline Distribution			
Stocks first of month			74,849 Bbls.
Production during month			671,691 "
Quantity mixed with Crude or Unfinished Oils		221,950 Bbls.	
Used in Blending at Refineries		449,923 "	
Stocks end of month		57,075 "	
Used at Plants, Shortage and Evaporation Losses		17,592 "	
TOTALS		746,540 "	746,540 "
Finished Gasoline Produced at Plants		303,503 Gals.	
Stocks Natural-Gas Gasoline held by Natural-Gas Gasoline Plant Operators		837,648 "	19,944 "
Stocks Natural-Gas Gasoline held by Refiners		1,559,502 "	37,131 "
Total Stocks Natural-Gas Gasoline		2,397,150 "	57,075 "
Stocks Finished Gasoline (Motor Fuel) held by Natural-Gas Gasoline Operators		24,463 "	

California *and* Wyoming Natural Gas Gasoline Plants Listed

A LIST of the natural gas gasoline plants in California and Wyoming, with plant location, type, capacity, operating status, and in some cases the plant superintenden's name, is given below.

CALIFORNIA

Name and Location of Plants	Type	Capacity in Gallons	Plant Supt.	Status
Associated Oil Co., San Joaquin Valley	Absp.	3,700		Op.
Ventura	Absp.	10,000		Op.
Bankline Oil Co., Signal Hill	Absp.	25,000		Op.
Brea Canyon Oil Co., Brea	Comp.	4,000		Op.
California Gasoline Co., Athens	Absp.	25,000		Op.
Signal Hill (3)	Absp.	40,000		Op.
California Petroleum Corp., Long Beach	Absp.	12,500	Walter Davis	Op.
Santa Fe Springs	Absp.	15,500	A. Rowe	Op.
Huntington Beach	Absp.	2,500	Geo. Williams	Op.
Calumet Oil Co., Fillmore	Comp.	450		Op.
Canadian Pacific Oil Co., San Joaquin Valley	Absp.	200		Op.
Central Oil Co., Huntington Beach	Absp.	250		Op.
Whittier	Absp.	400		Op.
Cowen Oil & Refining Co., Rosecrans (2)	Absp.	10,000		Op.
Export Refining Co., Torrance	Absp.	8,000		Op.
Fellows Gasoline Co., Santa Fe	Comp.	20,000		Op.
Fields (O. C.) Gasoline Co., Huntington Beach	Absp.	6,000		Op.
Fullerton Oil Co., Fullerton	Both	2,000	N. J. Allen	Op.
General Petroleum Corp., Santa Fe Springs	Absp.	20,00		Op.
Ventura	Absp.	10,000		Op.
Gilmore Oil Co., Plant No. 1, Signal Hill	Both	7,500	J. C. Burks	Op.
Plant No. 2, Maricopa	Both	1,500		Op.
Guardian Gasoline Corp., Maricopa	Absp.	6,000		Op.

The California

Hot Water in One Minute

Two Sizes for 30 to 60 gallon tanks.

Two Colors, Black Japan or Gray Enamel

A Western Product

Sold Through Dealers Only

Manufactured by

Western Sheet Metal Works

1911 Mission St. San Francisco

THE satisfactory service given by SEXTON Patented Hotel Gas Ranges and Kitchen Appliances continually demonstrates the advantages of gas equipment in Hotels, Restaurants and Institutions when correctly designed and properly installed.

S. B. SEXTON

STOVE & MFG. CORP.

Baltimore, Md.

Pacific Coast Representative

THE T. G. ARROWSMITH CO.

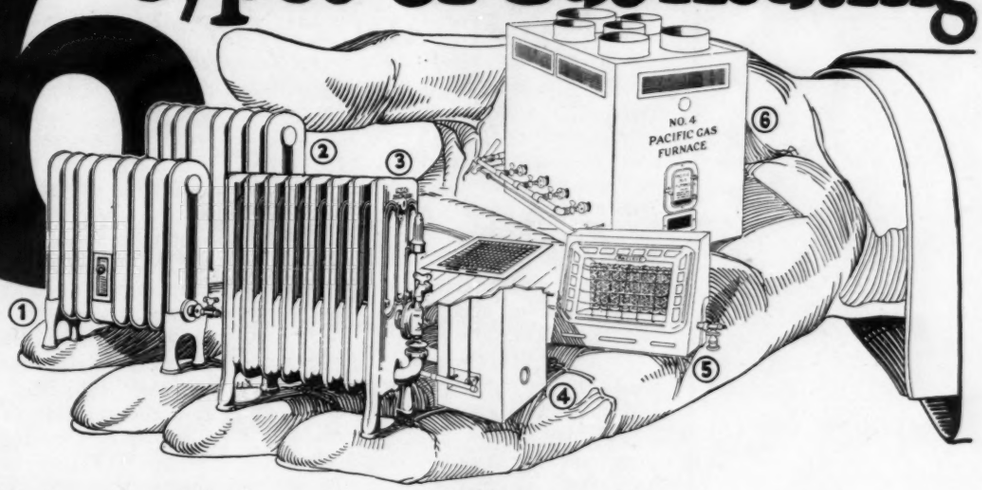
135 Montgomery St., San Francisco

Holly Oil Co., Huntington Beach	Absp.	5,500	K. R. Nelson	Op.
Honolulu Oil Cons., San Joaquin Valley (3)	Both	16,000		Op.
Hurley-Smith, Brea, Salt Lake Field	Absp.	900		Op.
Industrial Fuel Supply Co., Santa Fe Springs	Comp.	2,000		Op.
Interstate Oil Co., Midway	Comp.	1,000		Op.
La Habra Gasoline Co., Brea	Comp.	900		Op.
San Joaquin Valley	Both	4,200		Op.
Lomita Gasoline Co., Long Beach	Absp.	1,400	L. V. Cassaday	Op.
Long Beach Gasoline Co., Long Beach	Absp.	30,000		Op.
Lovell Gasoline Co., Taft (2)	Absp.	10,000	F. Huntington	Op.
Torrance	Absp.	7,000	F. Huntington	Op.
Ballell	Absp.	6,000	F. Huntington	Op.
Lowell Gasoline Co., San Joaquin Valley	Both	1,000		Op.
Montebello Oil Co., Fillmore	Absp.	3,000		Op.
Mosier, M. H., Huntington Beach	Absp.	2,000		Op.
Mutual Refining Co., Huntington Beach	Absp.	1,000		Op.
North American Consolidated, Midway	Absp.	10,000		Op.
San Joaquin Valley	Absp.	1,500		Op.
Norwalk Co., Santa Fe Springs	Absp.	25,000		Op.
Oakridge Oil Co., Ventura	Both	5,000		Op.
Olinda Gas Co., Olinda	Comp.	5,000		Op.
Pacific Gasoline Co., Athens	Absp.	12,000	J. E. Schermayer	Op.
Brea	Absp.	2,000	H. C. Hendricks	Op.
Dominguez	Absp.	10,000	I. W. Willard	Op.
Huntington Beach No. 1	Absp.	10,000	A. G. Maule	Op.
Huntington Beach No. 2	Absp.	8,000	R. C. Hobbs	Op.
Inglewood	Absp.	5,000	S. L. Miller	Op.
Long Beach	Hi. Press Absp.	6,000	H. T. Case	Op.
Santa Fe No. 2	Absp.	12,000	R. I. Jones	Op.
Santa Fe No. 3	Hi. Press Absp.	4,000	L. W. Oliver	Op.
Torrance	Absp.	1,500	F. A. Mason	Op.
Ventura No. 1	Absp.	12,000	H. B. Snyder	Op.
Ventura No. 2	Absp.	15,000	F. Long, Jr.	Op.
Ventura No. 3	Absp. Char.	4,000		Bldg.
Inglewood No. 2	Absp.	5,000		Bldg.
Fellows	Absp.	4,000	Earl Mulroy	Op.
Kerto	Absp.	7,500	A. I. Lawson	Op.
Puritan, Midway Field	Absp.	25,000	F. McGuire	Op.
Lakeview, Midway Field	Absp.	20,000	J. E. Miller	Op.
Nineteen G, Midway Field	Absp.	14,000	L. Gauslin	Op.
Sixteen, Midway Field	Absp.	12,000	L. D. Fraser	Op.
31-E, Sunset Field	Absp.	2,500	I. W. Seale	Op.
35-S, Elk Hills Field	Absp.	5,000	F. E. Clark	Op.
31-S, Elk Hills Field	Absp.	4,000	C. L. Campbell	Op.
29-G, Midway Field	Absp.	22,000	W. M. Weimer	Op.
Pacific Natural Gas Co., Rosecans (2)	Absp.	15,000		Op.
Pan American Oil Co., San Joaquin Valley	Both	5,000		Op.
Pan American Petroleum Co., Torrance	Both	3,500	A. M. Toler	Op.
Signal Hill	Both	3,500	A. M. Toler	Op.
Crampton, No. 3, Elk Hills	Both	8,500	Wm. J. Hay	Op.
Rubel Gas Plant, Inglewood	Both	10,000	H. S. Scanlon	Op.
Petroleum Co., Brea	Absp.	100		Op.
Santa Fe Springs	Comp.	10,000		Op.
Petroleum Midway Ltd., Huntington Beach	Absp.	3,000		Op.
Signal Hill	Both	20,000		Op.
Producers Gasoline Co., Athens (2)	Both	27,000		Op.
Rancho La Brea Oil Co., Salt Lake Field	Comp.	1,500		Op.
Red Star Petroleum Co., Montebello	Absp.	500		Op.
Rex Gasoline Co., Signal Hill	Absp.	5,000		Op.
Rice Ranch Oil Co., Santa Maria	Absp.	4,000		Op.
Richfield Oil Co., Maricopa	Absp.	2,000		Op.
Rio Grande Oil Co., Santa Fe	Absp.	3,000	C. E. Redd	Op.
Sandoma Gasoline Co., Santa Fe Springs	Absp.	3,000		Op.
Sentinel Oil Co., Torrance	Both	2,500	Fred B. Bowe	Op.
Athens	Both	1,775	Fred B. Bowe	Op.
Shell Oil Co. of California, Brea	Absp.	9,000		Op.
Columbia	Absp.	5,000		Op.
Dominguez Hill	Absp. Char.	40,000		Op.
Long Beach	Absp. Char.	65,000		Op.
Oilfields	Absp.	4,000		Op.
Santa Maria	Absp.	5,000		Op.
Ventura	Absp. Char.	10,000		Op.
Signal Gasoline Corp., Huntington Beach-Signal Hill	Absp.	25,000		Op.
Signal Gasoline Co., Signal Hill (2)	Absp.	11,000		Op.
Dominguez	Absp.	8,000		Op.
Standard Oil Co., Huntington Beach	Comp.	20,000		Op.
Inglewood	Both	5,000		Bldg.
Richfield	Absp.	20,000		Op.
San Joaquin Valley (8)	Both	65,000		Op.
Santa Fe	Both	10,000		Op.
Whittier	Comp.	1,500		Op
Sterling Gasoline Co., Athens	Absp.	5,000		Op.
Signal Hill	Absp.	6,000		Op.
St. Helens Petroleum Co., Ltd., Brea	Comp.	200		Op.
Loftus	Absp.	200		Op.
Midway (2)	Absp.	1,000		Op.
Montebello	Absp.	1,500		Op.
Richfield	Absp.	400		Op.
San Joaquin (Taft)	Absp.	2,200		Op.
Surety Gasoline Co., Huntington Beach	Absp.	11,000	C. Gotterba	Op.
Torrance Gasoline & Refining Co., Torrance	Absp.	5,000		Op.
Union Oil Co., Orcutt	Absp.	30,000	F. M. Penter	Op.
Torrey Plant, Piru	Absp.	600	C. L. Kirkham	Op.
Stearns No. 2 Plant, Brea	Absp.	900	L. L. Lemmon	Op.
Copeland Plant, Huntington Beach	Absp.	7,800	J. S. Anderson	Op.
Bell Plant, Santa Fe	Absp.	12,000	Z. B. Brown	Op.
Dominguez	Absp.	44,000	H. L. McCarty	Op.
Richfield Plant, Placentia	Absp.	18,000	L. L. Lemmon	Op.
Rosecrans	Absp.	26,000	R. D. Gibbs	Op.
U. S. Refining Co.	Absp.	15,000	W. P. Andrews	Op.
Ventura Refining Co., Montebello	Absp.	5,000		Op.
Santa Paula	Absp.	1,000		Op.
West Coast Refining Co., Richfield	Absp.	7,000		Op.
Santa Maria	Absp.	3,000		Op.

WYOMING

Carter Oil Co., Salt Creek	Absp.	20,000	R. G. Stoner	Op.
Continental Oil Co., Rock River	Absp.	4,000		Op.
Salt Creek	Comp.	40,000		Op.
Ohio Oil Co., Grass Creek	Comp.	5,000		Op.
Salt Creek	Comp.	10,000		Op.
Producers & Refiners Corp., Casper	Absp.	7,000		Op.
Riverton	Absp.	1,000		Op.

6 types of Gas Heating



Give Your Customers What They Want *from* PACIFIC'S *Complete Line*

Concentrate on Pacific Gas heating equipment and you can build a bigger business by always giving satisfaction to your customers!

All the factors are right for you to succeed with Pacific: Pacific equipment is designed especially for Western conditions. Pacific installations far exceed all competition. Every possible heating requirement is met by one of the 6 Pacific types. The Pacific line is favorably known and strongly advertised.

Here are the Six Leading Types of Pacific Gas Heating Appliances—They Ventilate while They Heat.

Pacific Pressed Metal and Cast Iron Radiators

An exclusive air circulation system—develops greater heat at a 25% saving in gas. Sturdier construction. Special features.

Pacific Gas Steam Radiators

Provide steam heat at lower cost than a central steam heating plant. Automatic control.

Pacific Floor Furnaces

No basement needed. Just turn a key. A pilot light ignites the gas. Instant heat! Two different systems of heating and air circulation are scientifically combined to give greater heat with less gas.

Pacific Unit Furnaces

Installed in basement or recess and supplies heat through pipes to all rooms. Upstairs control. Automatic temperature regulation if desired.

Pacific Gas Recess Radiant Heaters

Furnished in any desired finish. An air duct supplies a continuous stream of fresh air to the flame. Outer cashing is always cool.

A special staff of Pacific Heating Engineers is maintained to help you whenever the occasion arises.

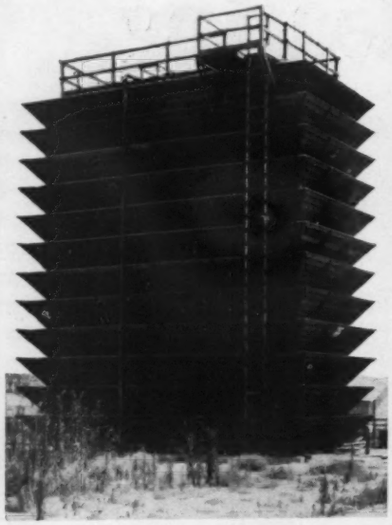
Why waste time pioneering an unknown line when you can make more money on Pacific? Avoid duplication of types, avoid carrying heavy stocks, avoid excessive bookkeeping! Simplify your business and multiply your profits by concentrating on Pacific. Write today for agency proposition.

See listing in Sweet's 1926 Architectural Catalog—Pages 2220-1 and 2116-7

Pacific Gas Radiator

Gas Heating **Company** *Headquarters*

1740 W. Washington St.—BEacon 2190 616 West 8th St.—MEtropolitan 2398
Factory and Foundry 7541 Roseberry Street, Los Angeles. Branches Throughout the West.



When
You
Need
COLD
WATER
Buy
the
FLUOR

ATMOSPHERIC
COOLING TOWER

FOR REAL
SATISFACTION

FLUOR
CONSTRUCTION CO.
Constructors and Engineers
707 Van Nuys Bldg.
Los Angeles, Calif.

Natural Gasoline Engineers Organize *for* Research

(Continued from Page 21)

extremely volatile and "weathered" rapidly even at 0° F. They also found that by placing their low-pressure testing apparatus on the vent of the condenser while making an atmospheric charcoal distillation, they in some cases, obtained more condensate in their low-temperature apparatus than was obtained in the receiver of the charcoal distillation apparatus.

Defining natural gasoline as "a composite of any or all of those hydro-carbon substances occurring in natural gas which may be present in considerable proportion in the liquid state under ordinary conditions of temperature and pressure," the present effort of the research organization is "to fractionate as sharply as possible between the two substances Propane and Butane, obtaining as liquid condensate all of the Butane and heavier constituents of the gas, and eliminating the Propane and lighter constituents. Accurate quantitative tests must determine the degree to which this fractionation is possible. Analyses of both the gas and the gasoline condensate will be made in the course of the study. The Carbide and Carbon Chemicals Corporation has volunteered to do this analytical work in its Los Angeles laboratory.

On September 23, 1925, at the Signal Hill Gasoline Company's laboratory an invitational meeting was held, at which representatives of several companies there present decided upon the plan to be followed in the research upon the physical refrigeration method. Definite organization of the group has been made subsequent to this preliminary meeting, but the method followed remains the same. Each company's representatives conduct independent investigations, turning in the results to the Signal Hill Gasoline Company, which in turn distributes the information to all of the members contributing. This procedure will be effective over a considerable period, perhaps a year or more, and when sufficient data have been obtained the results will be classified and an attempt made to arrive at the ideal set of conditions under which the test is to be performed. In order that standard conditions may prevail throughout the various tests the Signal Hill Gasoline Company has installed continuous gas samplers by which samples of gas up to a volume of 50 cu. ft. may be taken, at its Plant No. 1; gas of a constant quality being assured, the tests may definitely be compared as to results.

To date the investigation has gone through the preliminary stage and several contributions have been made toward the assembling of the information which will serve as a basis for the standardization of procedure for the physical refrigeration method. At the meeting of September 23 a paper by L. O. Warner and M. L. Arnold was read, as the first contribution of the Signal Hill Gasoline Company, the subject being "Preliminary Results of Tests for Gasoline by Physical Refrigeration." The same company submitted a second contribution at a meeting of October 28, in the form of a laboratory demonstration by Messrs. Warner and Arnold. A test was run in the laboratory of the company, and those who attended were given final results in gallons per thousand cubic feet nine minutes after the beginning of the test. This, especially in view of the fact that it was the first run ever made with the particular apparatus used, was regarded as a highly exceptional demonstration. "A Preliminary Report on the Effect of Rate of Gas Flow on the Results of the Physical Refrigeration Test" was the subject of the Signal Hill Gasoline Company's third contribution, submitted as a paper by Messrs. Warner and Arnold at the December 2 meeting.

At this same meeting a paper by Henry N. Wade of the Lomita Gasoline Company was distributed, its title being "Determination of Gas Content of Natural Gas by Low Pressure Condensation and Continuous Fractionation." The preliminary report of the Export Refining Corporation has also been prepared and is ready for distribution, its authors being Wm. A. Kirk and L. J. Patrosso of that Corporation.

Papers such as the above are presented with the sanction of the various companies, which are represented unofficially through their employees, though the companies themselves are not sponsoring the organization.

The following companies were represented at the meeting of December 2, at which formal organization took place:

United Oil Company, Signal Hill Gasoline Company, Lomita Gasoline Company, Union Oil Company, Shell Company, California Petroleum Company, Standard Oil Company, Signal Gasoline Company, Pacific Gasoline Company, Export Refining Corporation, California Gasoline Corporation, Carbide and Carbon Chemicals Corporation, General Petroleum Corporation, Chanslor Canfield Midway Oil Company, Reservoir Hill Gasoline Company, Bankline Oil Company, Newton Process Company.

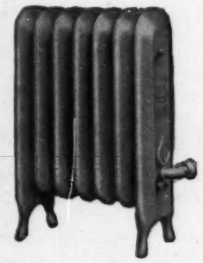
POTTER Heating

For many years POTTER Engineers have pioneered the way in the advancement of modern Gas Heating Systems. They have developed Gas Heating to such a degree of perfection that today, POTTER Products have become a standard of comparison wherever dependable, safe, economical and healthful gas heating is discussed.

OUR BEST ASSET

The tens of thousands of satisfied customers that our Organization has made through POTTER Gas Heating installations, is a JUST tribute to a satisfactory product—a gratification to conscientious effort.

THERE ARE MANY REASONS WHY IT IS BETTER TO INSTALL POTTER SYSTEMS

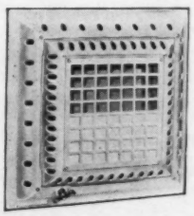


POTTER Vented Radiators

Only POTTER has these 7 POTTER Features

(Cast Iron and Steel-Made)

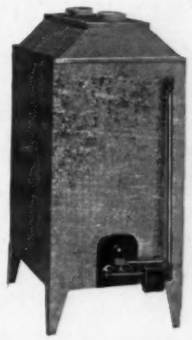
1. Condensation abolished. This does away with corrosion. Many years are added to the life of the Radiator.
2. Triple Circulation. The heat goes into the room, not up the flue.
3. Uniform warmth distribution. The air is never "cooked."
4. Quick heat. No other radiator heats so quickly as the light, efficient POTTER Steel-Made.
5. Aristocratic appearance. The POTTER Cast Iron Radiator is selected for the finest and largest homes.
6. Totally odorless always.
7. Not expensive.



COLE Floor and Wall Heaters

Made in heavy solid cast aluminum.

COLE is the only furnace manufactured that can be installed on either the first or second floor.



"MAGIC WAY" FURNACES

"MAGIC WAY" was the first, and has always been considered the leading Unit System of heating.

The principle of Unit Heating of modern buildings, brought to its present state of refinement through the study and efforts of this Organization, is based on the principle of an individual furnace or heater for each room or group of rooms to be heated.

This type of installation allows accurate temperature control in each room, regardless of the demand in other sections of the home.

POTTER quantity production now makes "MAGIC WAY" with electric controls, available to anyone who desires a gas furnace system.

The same features that make these well known POTTER-made appliances favorites with home builders and home owners, make them popular with churches, schools, theatres, auditoriums and factories.

The low cost of adequate heating by means of "MAGIC WAY" Vented Furnaces of either the Unit or Central Plant type, will be a revelation.

"MAGIC WAY" VALVES

By merely pressing a button, the temperature of any room may be regulated. This valve not only turns the heat on but it regulates the heat to suit your exact wants.

The HALL Floor Furnace

When the furnace type of heat is desired at low cost or when a basement is not available, use HALL Vented Floor Furnaces.

Potter Heating Includes:

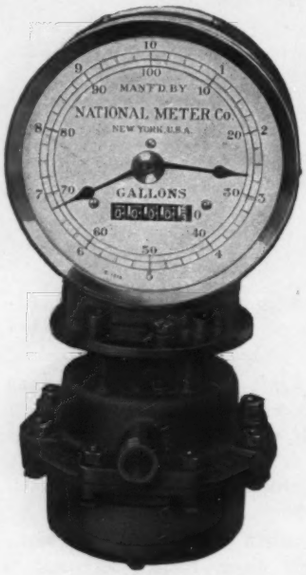
"MAGIC WAY" UNIT FURNACES
"POTTER" GAS RADIATORS
"RA DO" GAS RADIATORS
"HALL" GAS FURNACES
"STEEL-MADE" GAS RADIATORS
"COLE" FLOOR AND WALL FURNACES

There Is a **POTTER System** for Every Need

POTTER RADIATOR CORPORATION

San Francisco—Oakland—Los Angeles—San Diego

OIL METERS



The EMPIRE

Positive displacement, oscillating piston design.

Different from every other type of meter.

Unsurpassed in over forty years for accuracy, durability, and low cost of upkeep.

Used with highest satisfaction by

Gas Companies

in every section of the country.

Made in all sizes, 5/8 in. to 6 in., inclusive.

EMPIRE Oscillating Piston Oil Meters are fully described and illustrated in Circular 110-W. Send postal for your copy.

National Meter Company

299 Broadway, New York

Chicago Boston Atlanta
San Francisco Cincinnati
Los Angeles

Turning the Control Valve That Admitted Gas Into the New System at Mare Island Naval Yards, Calif. Admiral J. H. Dayton, Commandant, Officiating

Naval Yard *is* Equipped *for* Gas

MARE ISLAND, California, where is located one of the largest of Pacific naval yards, is now equipped with a new gas system, as a result of an extension completed in December by the Pacific Gas and Electric Company.

The extension covers the laying of mains necessary to supply 11 officers' quarters, dry docks one and two, laboratory, electric department, copper shop, machine shop, sheet metal shop, pipe shop, boiler shop and foundry. In all, over a mile of pipe was laid to serve the government, the extension involving an expenditure of $35,452.50. Some 350 feet of extra heavy six-inch main were laid under the channel. In order to lay this submarine main it was necessary to dredge a special channel or resting place for the pipe.

Beginning of the new service was widely heralded in Vallejo, Calif., from which point the line was extended to Mare Island. A luncheon at which over 100 people were seated was held in the Vallejo Y. W. C. A. on December 11, at which Admiral J. H. Dayton, commandant of the naval yard at Mare Island; Superintendent Fisher of the Pacific Gas and Electric Company, Harry Ridgeway, district manager for the P. G. and E., and other officials spoke.

After the luncheon dedication of the new line and official opening of the controlling valve took place, following which Drydock No. 1 at the naval yard, where the first gas from the new main was used, was visited by those participating in the ceremonies.

As an interesting bit of local color it was pointed out that the first service to Mare Island was put in operation 48 years ago, the two-inch main across the channel being laid from a schooner with a hand windlass.

San Joaquin Companies Change Hands

CONTROLLING interest in three gas utilities of the San Joaquin Valley, California, passed to a financial group composed of William G. Kerckhoff, A. C. Balch and Ben R. Meyer, according to information released late in December. The companies concerned are the Central Counties Gas Company, serving Visalia, Tulare, Porterville, Farmersville, Exeter, Lindsay and Strathmore; the River Bend Gas and Water Company, supplying Dinuba, Kingsburg and Parlier; and the Hanford Gas and Power Company, serving Hanford.

Messrs. Kerckhoff, Balch and Meyer hold controlling interests in the Southern California Gas Company, the Midway Gas Company and the Valley Natural Gas Company. Mr. Balch and Mr. Kerckhoff, as is generally known, are responsible for the Pacific Light and Power Corporation's development of the Big Creek electrical project, now owned and operated by the Southern California Edison Company, and for the development of the properties of the San Joaquin Light and Power Corporation. Control of the latter corporation was recently sold. Their acquisition of the several above-named properties in the San Joaquin Valley may be taken as evidence of their faith in the future of this region, and extension of the gas systems to meet the growth of the communities served is assured.

A. B. Macbeth, executive vice-president of the Southern California Gas Company and the Midway Gas Company, is named trustee of the acquired interests. Mr. Macbeth states that the accumulated experience of the companies he represents will be put at the disposal of the San Joaquin companies.

F. W. Hunter, who has been president and general manager of the Central Counties Gas Company, will have general supervision over the acquired companies.

MINES AND OIL HEADS NAMED IN RECENT ELECTION

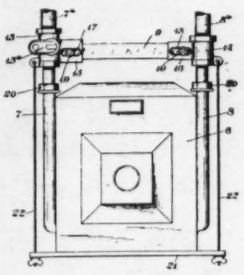
Annual election of the California Chamber of Mines and Oil held in Los Angeles in December, resulted in the choice of Chester W. Brown, director of exploration and production for the Union Oil Company of California, as president; Harry J. Bauer, president of the Pacific Gasoline Company, and Philip Wiseman, president of the United Eastern Milling Company, were elected vice-presidents, and H. L. Westbrook, vice-president of the Belridge Oil Company, treasurer.

H. R. AUSTIN LEAVES L. A. G. & E. AFTER 25 YEARS OF SERVICE

Concluding a 25 year period of service with the Los Angeles Gas and Electric Corporation, begun as a salesman in 1901 with the Los Angeles Gas Lighting Company, predecessor of the Corporation, H. R. Austin has resigned from his present position as assistant to the president. A special meeting of the Corporation's advisory committee was called to present Mr. Austin with a handsome, suitably engraved wrist watch, as a mark of appreciation of his services.

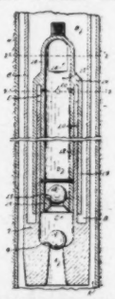
THIS MONTH'S PATENTS PERTAINING TO THE INDUSTRY

1,547,131. GAS-METER-CONNECTING DEVICE. Frank E. Stevens, Columbus, Ohio, assignor to The Lattimer-Stevens Company, Columbus, Ohio, a Corporation of Ohio. Filed Mar. 27, 1924. Serial No. 702,343. 3 Claims. (Cl. 285—3.)



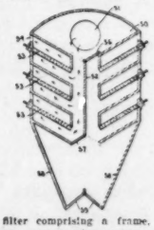
1. In combination with a meter, a meter hanger including inlet and outlet connecter pipe sections having seats, one of which is curved in cross section, a single bar for connecting said pipe sections to engage said seats one end of said bar being curved in cross section to fit said curved seat of one of the connecter sections and means for adjustably connecting said bar to said seats.

1,545,475. CONSTANT-DISCHARGE PUMP. Edward T. Adams, Los Angeles, Calif., assignor to Joseph G. Richardson, Los Angeles, Calif. Filed Aug. 27, 1924. Serial No. 734,407. 3 Claims. (Cl. 103—179.)



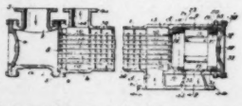
1. In a pump, a plunger embodying two co-axially arranged tubular members; one member of smaller diameter than the other, a casing embodying two co-axially arranged tubular members; one member of smaller diameter than the other; the plunger members coacting with the casing members to provide a main pump chamber and an auxiliary pump chamber; the auxiliary pump chamber being separated from the main pump chamber by one of the aforesaid tubular members, a standing valve, a port leading from said auxiliary pumping chamber to said main pumping chamber through that member which separates said chambers; said port being devoid of non-return means and providing constant communication between said pumping chambers; the said member being open at the upper end and devoid of non-return means, and a working valve carried by the smaller tubular plunger member at a point below said ports; whereby some of the fluid raised by said working valve during the up stroke of the plunger will be drawn into said auxiliary pumping chamber to be subsequently discharged therefrom on the following downstroke of the said plunger.

1,538,985. GAS-CLEANING APPARATUS. Oscar V. Greene, Cleveland, Ohio. Filed Aug. 17, 1921. Serial No. 493,169. 7 Claims. (Cl. 183—59.)



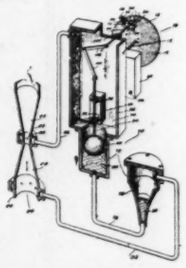
1. A gas filter comprising a frame, a plurality of relatively coarse woven wire screens mounted therein under tension; a plurality of other finer screens mounted upon and between said tensioned screens, and means adapted to jar said screens.

1,539,267. HEAT-EXCHANGE APPARATUS. Karl Muhleisen, Philadelphia, Pa., assignor to Schutte and Koerting Company, Philadelphia, Pa., a Corporation of Pennsylvania. Filed Mar. 29, 1923. Serial No. 628,430. 7 Claims. (Cl. 257—236.)



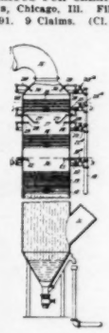
1. In heat exchange apparatus, the combination of a casing, a plurality of tubes therein, a tube plate relatively movable with respect to the said casing to which one end of each of said tubes is connected, the said tube plate having at its peripheral edge an outwardly extending flange which is spaced from the inner surface of the said casing, packing within the space between the said flange and the said casing, a head plate for closing the adjacent end of said casing, which head plate is adjustable axially of said casing and means intermediate the said head plate and the said packing whereby upon adjustment of the said head plate inwardly the said packing is compressed.

1,540,737. FLOW METER. Frederick N. Connet, Providence, R. I., assignor to Builders Iron Foundry, Providence, R. I., a Corporation of Rhode Island. Filed Aug. 16, 1924. Serial No. 732,589. 5 Claims. (Cl. 235—61.)



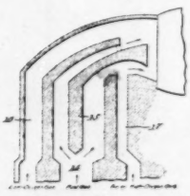
5. In an integrating flow meter having pressure differential producing element attached to a conduit, an integrator of the sine type having a friction driven wheel, small rollers substantially forming the periphery of said wheel, and means actuated by said pressure differential producing element to continuously twist said friction driven wheel to an angle whose sine is proportional to the rate of flow in said conduit.

1,543,941. APPARATUS FOR CLEANING GAS. Walther Mathesius, Chicago, Ill. Filed June 5, 1922. Serial No. 566,091. 9 Claims. (Cl. 261—111.)



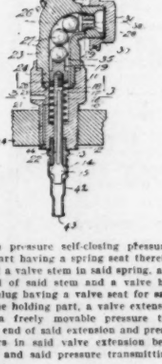
1. In combination, a gas washer comprising a gas container having a gas inlet and a gas outlet, and spraying means adapted to spray a liquid for forming a vortex of cleansing liquid in said container extending across its entire cross-sectional area whereby all of the gas passing through the container is subjected to the washing action of the vortex.

1,545,823. METHOD OF WORKING OPEN-HEARTH FURNACES AND THE LIKE. Alexander L. Feild, Jackson Heights, N. Y., assignor to The Linde Air Products Company, a Corporation of Ohio. Filed Apr. 29, 1924. Serial No. 709,900. 7 Claims. (Cl. 263—44.)



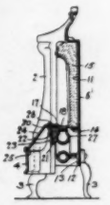
7. Process of working furnaces of the open-hearth type, comprising heating the bath by burning a fuel gas with a gas containing oxygen in greater proportion than that in atmospheric air, and passing in contact with the inner surface of the furnace roof a preheated combustible gas and a preheated low-oxygen gas, whereby the roof is shielded from the destructive action of heat from the bath.

1,539,054. SELF-CLOSING CHECK VALVE. Charles Meldau, New York, N. Y. Filed Sept. 23, 1922. Serial No. 589,966. 3 Claims. (Cl. 137—139.)



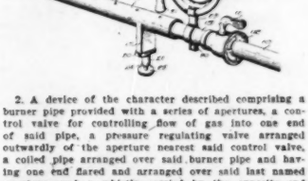
3. In a high pressure self-closing pressure valve, a valve holding part having a spring seat therein, a spring in said seat and a valve stem in said spring, a valve stem nut on one end of said stem and a valve head at the other, a valve plug having a valve seat for said head located beyond the holding part, a valve extension on said holding part, a freely movable pressure transmitting disk in the free end of said extension and pressure transmitting members in said valve extension between said valve stem nut and said pressure transmitting disk.

1,546,945. GAS HEATER. Alexander B. Sharpe, Steubenville, Ohio, assignor to The Ohio Foundry and Manufacturing Co., Steubenville, Ohio, a Corporation of Ohio. Filed Apr. 14, 1924. Serial No. 706,426. 4 Claims. (Cl. 126—92.)



1. In a gas-heater, the combination with a suitable frame and a sheet metal back-wall connected thereto, the lower end of said back-wall being turned upwardly, a sheet-metal supplemental back-wall with its lower end fitting in the groove formed by said upturned portion of said back-wall, said supplemental back-wall being bent on itself to form a ledge, and a fire-back resting on said ledge.

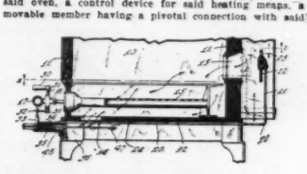
1,542,393. GAS BURNER. Demetrios K. Karamanos, Joliet, Ill. Filed Sept. 19, 1924. Serial No. 738,686. 3 Claims. (Cl. 116—700.)



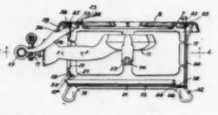
2. A device of the character described comprising a burner pipe provided with a series of apertures, a control valve for controlling flow of gas into one end of said pipe, a pressure regulating valve arranged outwardly of the aperture nearest said control valve, a coiled pipe arranged over said burner pipe and having one end flared and arranged over said last named aperture, and a whistle carried by the opposite end of said coiled pipe and adapted to be actuated when the flame of the burner is extinguished while said control valve is open.

1,543,694. COOKING STOVE. John E. Chambers, Shelbyville, Ind. Filed Apr. 17, 1924. Serial No. 707,250. 12 Claims. (Cl. 126—42.)

1. In combination, an oven having heat-insulating walls and ventilation-control means, heating means for said oven, a control device for said heating means, a movable member having a pivotal connection with said ventilation control means, said member being rotatable about the axis of said pivotal connection to control the operation of said heat-control device.

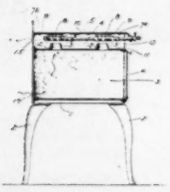


1,546,104. GAS HOT PLATE. George E. Pickup, Newark, Ohio, assignor to The Wehrle Company, Newark, Ohio, a Corporation of Ohio. Filed Sept. 11, 1922. Serial No. 587,639. 3 Claims. (Cl. 126—40.)



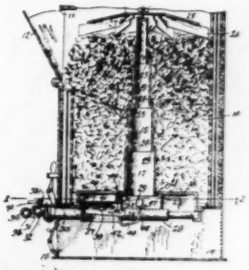
1. A hot plate comprising a rigid top frame provided with one or more grid openings, a pair of rigid end plates, means for detachably securing the end plates to the under side of the top plate at opposite ends of the latter, said end plates constituting supports for the top plate, and a rear plate interposed between and interengaging with said end plates so as to be held in position by the end plates when the latter are secured to the top plate, said rear plate and the two end plates coacting with the top plate to provide a burner chamber.

1,546,650. GAS RANGE. Clarence R. Graham, San Francisco, Calif., assignor to James Graham Manufacturing Co., San Francisco, Calif., a Corporation of California. Filed June 23, 1924. Serial No. 721,621. 8 Claims. (Cl. 126—39.)



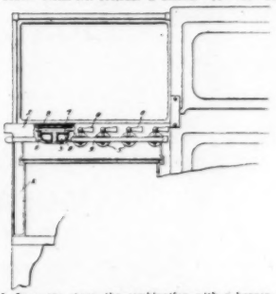
1. A gas range comprising a body portion supported by legs, a closed top plate supported on the body and having a plurality of removable grids, a gas burner beneath and closely adjacent each grid, and a bottom plate beneath the top plate and burners providing a single combustion chamber in which the burners are housed, the bottom plate having an opening therethrough beneath each burner to permit the passage of air upwardly therethrough to the burners.

1,545,497. AUTOMATIC SHUT-OFF MECHANISM FOR INCINERATOR VALVES. Edward Kenes, Jr., Buffalo, N. Y. Filed Feb. 12, 1924. Serial No. 692,394. 9 Claims. (Cl. 110—18.)



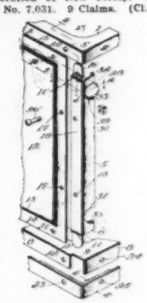
1. An incinerator comprising a combustion chamber adapted to receive the pile of refuse to be destroyed, a gas burner adapted to provide a flame for consuming said refuse, and having a member which descends by gravity as the level of the pile of refuse lowers while being consumed by said flame, and automatic means for shutting-off said valve which are actuated by the descent of said member to its lowered position.

1,544,979. GAS RANGE. John Hansen, Port Chester, N. Y., assignor to Abendroth Brothers, Port Chester, N. Y., a Corporation of New York. Filed Dec. 6, 1923. Serial No. 678,925. 2 Claims. (Cl. 126—214.)



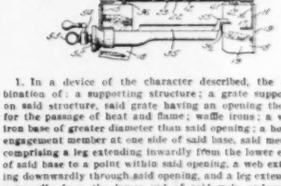
1. In a gas stove, the combination with a burner, of a top plate provided with an aperture above the burner adapted to receive a cooking utensil, a removable grid supported within said aperture entirely below the plane of the upper surface of the top plate, and a removable cover plate of substantially the same diameter as the aperture supported on the grid and having its upper face flush with the surrounding surface of the top plate.

1,546,247. BURNER-TOP-SUPPORTING CONSTRUCTION. Henry Morcker, Jr., Homewood, and Theodore Thompson and Otto Hammerbiester, Harvey, Ill., assignors to American Stove Company, St. Louis, Mo., a Corporation of New Jersey. Filed Feb. 5, 1925. Serial No. 7,031. 9 Claims. (Cl. 126—39.)



1. A gas stove construction comprising a burner top having a depending flange, a base, and a reversible bar between the top and base, said bar having at both ends projecting lips of substantially the same length, said lips curved inwardly to fit within the flange of the said top.

1,545,675. COMBINATION WAFFLE STOVE AND GAS PLATE. Peter Madsen, Los Angeles, and Le Roy M. Toms, Maywood, Calif., assignors to Madsen Iron Works, a Corporation of California. Filed July 18, 1923. Serial No. 652,288. 3 Claims. (Cl. 126—41.)



1. In a device of the character described, the combination of: a supporting structure; a grate supported on said structure, said grate having an opening therein for the passage of heat and flame; waffle irons; a waffle iron base of greater diameter than said opening; a hooked engagement member at one side of said base, said member comprising a leg extending inwardly from the lower edges of said base to a point within said opening, a web extending downwardly through said opening, and a leg extending outwardly from the lower end of said web, underneath the edge confining said opening; and an engagement member at the opposite side of said base, said engagement member comprising a leg extending inwardly from the edge of said base and a leg extending downwardly from the inner end of said inwardly extending leg, through said grate opening.

Los Angeles Biltmore

Host to the Oil
and Gas Men

John McEntee Bowman, *President*
James Woods, *Vice President*
Charles Baad, *Manager*

FITTINGS

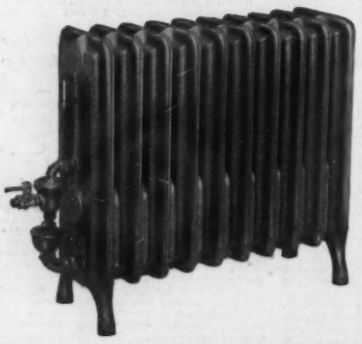
You can order fittings of any kind for immediate delivery from our large stock.

We also produce:

FLINTCAST CORROSIRON
MONEL METAL GREY IRON
SPECIAL IRON

PACIFIC FOUNDRY COMPANY
Harrison and Eighteenth Streets,
San Francisco

THE LATEST



Hammel
Gas Steam Radiators

Unit System of Heating — Steam Heat in Ten Minutes

WE ARE now able to offer some very profitable territory to dealers who can qualify. The *Hammel* line offers a very liberal profit and its repeat orders will build a substantial business for you.

Good Territory for Live Dealers
Write for Literature

Hammel Radiator Corporation
715 So. Figueroa St. Los Angeles

K. L. Reynolds *A. E. Morphy*

Promotions *in* Pacific Gasoline Company

AT a meeting of the board of directors of the Pacific Gasoline Company held Tuesday, December 22d, Kenyon L. Reynolds, formerly assistant general manager, was elected vice president and general manager; A. E. Morphy, formerly secretary, was elected vice president and treasurer of the Company, and Thos. N. St. Hill, executive assistant, was elected assistant secretary and treasurer. President Harry J. Bauer retains his position as head of the Company, though under the new arrangement his former duties as general manager will devolve upon Mr. Reynolds.

Mr. Reynolds has been connected with the company for the past ten years, his service beginning with the duties of plant roustabout shortly after his graduation from the University of California. Since those early days of the natural gasoline industry many changes in methods of operation have taken place, and it has been largely through the work of Mr. Reynolds that Pacific Gasoline Company has kept pace with the latest developments in its field.

Mr. Morphy has served as secretary of Pacific Gasoline Company since 1922, prior to which time he held a similar position with the Southern California Edison Company. His wide experience has enabled him to work out many employee benefit ideas, not the least important of which is the group insurance plan in which more than 500 employees participate.

Mr. St. Hill came to the company a little more than two years ago, and as a member of the training squad served in all departments of the business. He is the first to complete the training plan, and this together with his studies at Yale-Sheffield, provides him with a foundation for bigger things in the future.

FINAL UNITS ARE INSTALLED IN STANDARD'S INGLEWOOD PLANT

The Standard Oil Company is just completing the installation of final units in its compressor plant at Inglewood. This plant consists of two 500 horse-power units and 16 units of 160 horse-power each, or a total of 3560 horse-power.

FESTIVITIES FOR L. A. GAS EMPLOYEES

January 8 has been set for a Corporation get-together at the L .A. Gas and Electric. Employees and their families will gather for a variety of entertainment, including dancing, cards, and inspection of the new office home of the Corporation at 810 So. Flower St., where the affair is to be held.

Geo. W. Smith now Chief Commercial Agent

PROMOTION of Geo. W. Smith, manager of the new business department and sales organization of the Southern Counties Gas Company in the Santa Monica Bay territory, to the position of chief commercial agent for the Company's 62 cities in Southern California, was announced recently at the regular monthly meeting of the utility's salesmen held in Los Angeles. The meeting was attended by the 20 salesmen, several district managers and by department heads from the utility's Los Angeles office.

In his new position, Mr. Smith will have charge of all the Southern Counties salesmen in Southern California. He will make his headquarters in Santa Monica where he now resides but will spend at least half of his time visiting the other districts served

Geo. W. Smith

by the company in Los Angeles, Orange, San Bernardino, Ventura and Santa Barbara counties.

Mr. Smith is recognized as one of the leading gas appliance and industrial engineers in the gas fraternity of Southern California. He has been with the Southern Counties Gas Company since 1918, when he started as salesman in the Monrovia district. He was transferred to the larger Long Beach district later, where he remained for several years. He went to the Santa Monica district a little more than a year ago and assumed the duties of new business manager there.

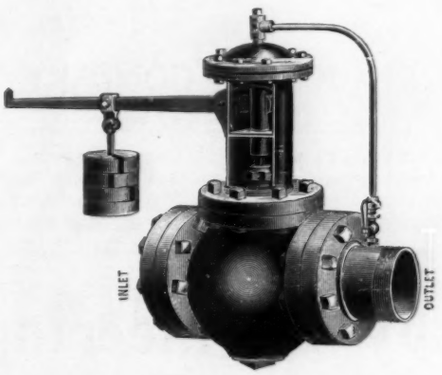
ECONOMY IN GAS BUILDS ULTIMATE BUSINESS

Educating the consumer to use gas intelligently for economy will result in increasing, rather than diminishing the domestic load, thinks the Utah Gas and Coke Company of Salt Lake City. The Company has under way a campaign of advertising through newspapers, window displays and radio messages, directed toward education in the efficient use of gas. Employees are being encouraged to fit themselves to give practical suggestions to consumers along the same line.

High Pressure or Reducing Regulator

The function of this regulator is to reduce the well or line pressure to such a number of pounds as may be safely handled by the low pressure regulator.

Our regular iron body class may be used on any inlet pressure up to 600 lbs. For higher pressures we make special Bronze body regulators. Get a copy of our catalogue, today.



The Chaplin-Fulton Mfg. Co.

Organized 1884—Oldest Builders of Gas Regulators in the County. Built in all Sizes, From 1 Inch to 24 Inches; For All Service. 1 oz. up to 1,500 lbs. Pressure to Square Inch.

Union Bank Bldg.—Telephone VAndike 7114 **Los Angeles, Calif.**

J. H. HILL, Representative

28-34 Penn Avenue **Pittsburgh, Pa.**

WESTERN GAS
626 South Spring Street,
Los Angeles, California

Starting with the next monthly issue, you may send WESTERN GAS to the undersigned. Upon receipt of invoice, remittance will be sent to cover (1 year $2.00) or (3 years $5.00).

Name ..... *Title* .....

Company .....

Address .....

City and State .....

Please Check

[ ] GAS COMPANY [ ] GAS APPLIANCES
[ ] NATURAL GASOLINE CO. [ ] MISCELLANEOUS

Subscription: 1 Year, $2.00; 3 Years, $5.00, in Advance

The—*King*

of all screw thread and Gasket Compounds

Key Graphite *Paste*

Stops the Leaks and Keeps 'em Stopped

Try a Sample on Your Hardest Joints at Our Expense

E-A-KEY INC. COMPANY
PACIFIC · COAST · REPRESENTATIVES
KEY·BOILER·EQUIPMENT·COMPANY

1301 Santa Fe Ave. Los Angeles, Calif.
17-19 Main St. San Francisco, Calif.

Byllesby Engineering and Management Corporation

231 S. La Salle St.
CHICAGO

New York Tacoma San Diego

Chas. C. Moore & Co. Engineers, Inc.

CONTRACTORS FOR COMPLETE PLANTS

High Grade Machinery

The Babcock & Wilcox water tube boilers
Corliss high speed and poppet valve engines
Babcock & Wilcox superheaters
Hamilton compressors
Green fuel economizers
Wheeler Condenser & Engineering Co. condensing machinery
Cochrane feed water heaters (open and closed)
Cochrane feed water softeners (hot and cold processes)
Cochrane feed water metering heaters
Cochrane steam and oil separators
Cochrane flow meters
Griscom-Russell Heaters, Evaporators, Distillers, Multi-Whirl Coolers
Moore automatic fuel oil regulators
Diamond soot blowers
Lagonda tube cleaners
Copes feed water regulators
Lagonda automatic boiler stop valves
Leslie reducing valves

And All Power Plant Auxiliaries

Address our nearest office for catalogs and complete information

Home Office: San FRANCISCO, Sheldon Bldg.
New York City, Hudson Terminal Bldg.
Los Angeles, Central Bldg. Portland, Gasco Bldg. Seattle, L. C. Smith Bldg.
Salt Lake City, Kearns Bldg. Honolulu, T. H. Phoenix, Heard Bldg.
Vancouver, B. C., Standard Bank Bldg.

Gas *Is the* Logical Fuel *for* Large Buildings

(Continued from Page 20)

ing oil, for such items as interest and depreciation on oil tanks, pipe lines, etc. Repairs, maintenance, labor and materials, including the cleaning of storage tanks and the disposal of refuse, are expenses that must be taken into consideration.

Burner expense includes the cost of the maintenance of the burners using oil. Wherever oil is used, the maintenance of fire-boxes and flues is largely due to the action of the oil on brick work and metal. Added insurance on buildings in which oil fires are used and elaborate and expensive equipment is not installed is a considerable item. Air, of course, is needed for combustion. Oil needs at least 50 per cent more air than gas and in average practice 100 per cent more air is used. Frequently oil is pumped at low pressure (20 lbs.) and steam or high-pressure air is used to atomize it. The cost of this steam or high-pressure air must be added to the oil cost.

Another charge that must in all fairness be made against the use of oil is for water, sand or gases in the oil lines causing burners to go out or require attention. Time spent by high-priced mechanics adjusting oil burners is far from being a negligible item.

Therefore, in choosing a fuel, *it is not what that fuel costs per heat unit but what it costs to burn it.* Although gas is more costly per heat unit it is a refined fuel and in the end it costs less to burn gas than to burn fuel oil under the conditions dealt with in this paper.

Now it is a significant fact that the boiler design is probably more responsible for the flexibility and the economies effected with gas-fired installations than the nature and the quality of the fuel itself. But on further consideration this fact is not baffling. One would not expect to obtain satisfactory results by burning fuel oil in an automobile engine; therefore why should one expect to obtain satisfactory results by burning gas in a boiler designed to burn coal. In fact, the former is more logical than the latter, for the coal boiler is designed for continuous operation while the load is intermittent as well as variable.

The two largest manufacturers of cast iron sectional boilers make a boiler designed for the use of gas fuel as well as a type designed for burning coal. Therefore, it is evident that the designing engineers of these two companies realize that many advantageous improvements are structually possible when gas fuel is burned and they have designed boilers embodying these features. If they thought that their coal-burning types

were satisfactory for gas fuel, they would not have gone to the trouble and the expense of developing a special gas-fired boiler.

There are many reasons why coal boilers equipped with gas burners will not give efficient, satisfactory results. These embody such subjects as relative grate area, relation of various heating surfaces to the flame, impingement of the products of combustion on these surfaces, draft conditions, etc., but inductive reasoning invites argument and difference of opinion. As actual results are the real interest rather than a technical discussion explaining the cause of these results, it is sufficient to state the results of experience without explanation or qualification.

Significant Building Survey

The Southern California Gas Company has made a survey of the various buildings in Los Angeles using gas fuel. The findings of this survey may be illustrated by two characteristic examples, the Union Bank Building and the California Bank Building. Both buildings are Class A, limit height structures, having banking rooms on the ground floors and offices on the upper floors. Both buildings were designed by the same firm of architects. The Union Bank Building has an equivalent of 10,500 square feet of direct radiation and a unit gas cost of $0.074 per square foot per heating season. The California Bank Building has an equivalent of 17,538 square feet of direct radiation and a unit gas cost of $0.117 per square foot per heating season. In other words, the building having a boiler plant designed to burn coal, but equipped with gas burners, required 58.1 per cent more fuel per unit of connected load than those having a boiler plant designed to burn gas. This survey showed that the plants designed to burn gas were consistent in efficiency and fuel consumption, while the converted plants consumed from 20 per cent to 130 per cent more fuel per unit of connected load than the gas-fired boiler plants.

It has been our experience that by having our combustion engineer operate these plants, we can reduce the gas consumption 50 per cent in plants where the worst conditions prevail. But he is never able to get results within 20 per cent of those obtained in boiler plants designed to burn gas, that are without expert supervision. Then, too, as soon as our engineer stops giving service on converted plants, the fuel consumption consistently rises to its previous high level.

So let our motto be, "We can heat the Pacific Coast more cheaply and conveniently with gas fuel than any other fuel if we insist upon the installation of appliances designed to burn gas."

Our Aim for 1926

To render a dependable service—To the greatest possible number of people—

Thru a liberal extension policy,

And always at the lowest possible cost consistent with the class of service rendered.

PACIFIC GAS AND ELECTRIC COMPANY

P·G·and E·

Owned · Operated · Managed
by Californians

1-126

SPRAGUE METERS

Represent Twenty-five Years
of Progress

We are proud of our Service
in the West

Sprague Meter Company

Los Angeles, California - - San Francisco, California

Cut Down Maintainance Cost

AND

LEAKAGE LOSSES

YOU CAN DO BOTH BY USING

MERCO NORDSTROM LUBRICATED VALVES

Merco Nordstrom Valve Company

110 West 40th St.
New York

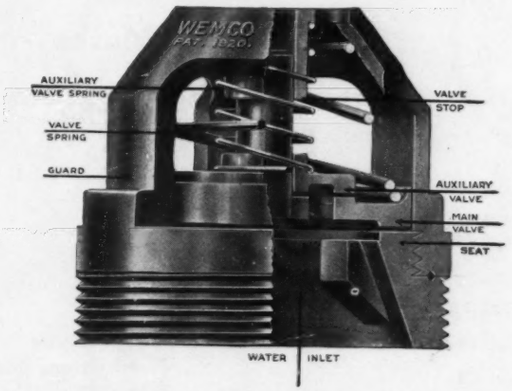
347 Peoples Gas Building
Chicago

613 Washington Ave.
Houston

Engineers Building
Cleveland

121 Second St.
San Francisco

Sledge Hammer Blows–



Wemco Valves increase the efficiency of pumps through greater areas, and the double guided positive seating action, thereby reducing pressure between your suction and discharge valves.

NOISY pumps, shortened life, constant replacements of valve parts, wear on packing and grooved seats constitute the price you pay for speeding your pumps over capacity. The Wemco Pump Valve eliminates these troubles, and insures shock-free operation at the highest speed. The Wemco engineers will be glad to solve your pump problems for you.

W. E. MUSHET CO.

700 2ND STREET SAN FRANCISCO

STANDARD OF THE PACIFIC COAST

RELIANCE
REGULATORS

Reliance Manufacturing Co., Pasadena, California

Gas Main Bags
Canvas Covered Bags
Safety Service Plugs
Gas Main Plugs
Pipe Cleaning Brushes

Asbestos Lead Joint
Runners
Air Line Gas Masks
Derricks
Packings, etc.

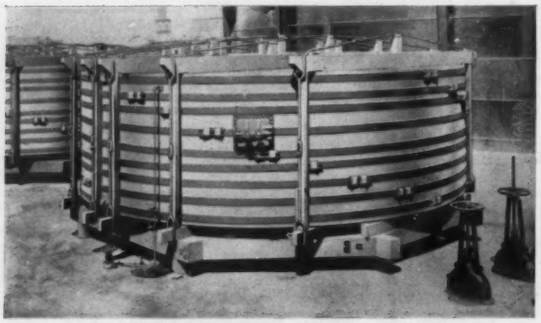
Safety Gas Main Stopper Company

523 Atlantic Avenue Brooklyn, New York

C. B. BABCOCK COMPANY
Western Representatives

135 Bluxome Street
San Francisco

Marsh-Strong Bldg.
Los Angeles, Cal.



30 Dia. x 9 Stave "Jones Type" Purifiers Installed for Pacific Gas & Electric Co.

Purifiers

Made of California Redwood will save you considerable money. The first installation cost is less.

"REDWOOD THE WOOD ETERNAL"

P G & E Co have approximately 40 of these purifiers in use—built by us.

Write for Catalogues & Prices

Pacific Tank & Pipe Co.

Dept. of Tilden Lumber & Mill Co.
320 Market St., San Francisco
4820 Santa Fe Ave., Los Angeles
400 High St., Oakland

Stauffer's FERROX Purifier

meets these essential requirements of a good Gas Purifier

A highly active Iron precipitate, with a high Iron content. A thoroughly impregnated and porous bulky mass, ready to use, no mixing, no delay, always uniform

A dependable source of supply

Stauffer Chemical Company

Pioneer manufacturers of Industrial Chemicals on the Pacific Coast.

624 California Street San Francisco, California

ABILITY EXPERIENCE SERVICE

THE VALVE MANUFACTURERS OF THE WEST

Hand or Power Operating

VALVES

Suitable for **Water—Steam Gas or Air of Any Pressure**

Structural Steel Plate Work

Valves 16" to 60" inches

High and Low Pressure

BOILERS

Llewellyn Horizontal Water Tube
Connelly High Pressure
Horizontal Return Tubular
and
Locomotive Types

Cast Iron or Cast Steel Pipe or Fittings

Llewellyn Iron Works Los Angeles, Cal.

Gas Governors and Regulators

(With or Without Mercury Seal)

High Pressure Service Governors
Low Pressure Service Governors
Separate Mercury Seals
Single District Station Governors
Double District Station Governors
Holder Governors
Intermediate Pressure Governors
High Pressure Line Regulators
Relief and Back Pressure Valves
Anti-Vacuum Quick Closing Valves

Free Engineering Service on all Pressure Conditions —Write Us

Reynolds Gas Regulator Company

Main Office and Factory Anderson, Indiana

Lux Material

BEST GAS PURIFIER THE ALPHA-LUX CO., Inc., 192 Front St., N.Y.

Stockton Fire Brick Company

FIRE BRICK, INSULATING BRICK
HIGH TEMPERATURE CEMENT

High Grade Refractories

for

GENERATOR LININGS

CHECKERS

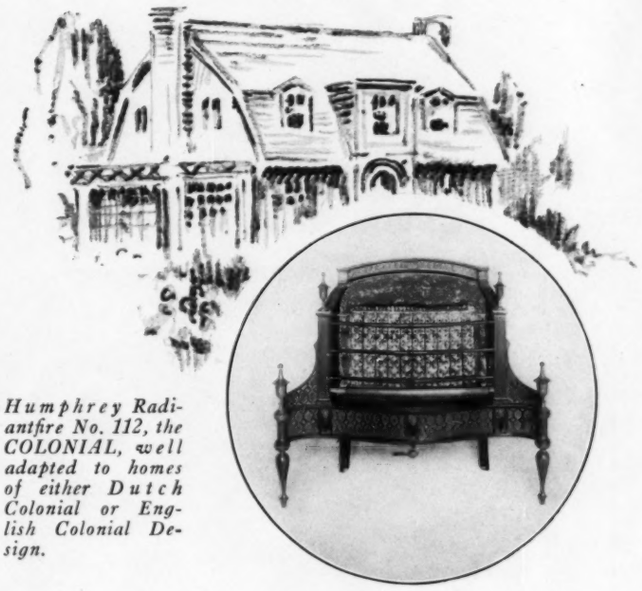
BOILER SETTINGS

OFFICE:
Rialto Building
San Francisco

WORKS:
Stockton
California

ADVERTISERS INDEX

The Alpha-Lux Co., Inc. 47
C. F. Braun & Co. 3
Byllesby Engineering and Management Corporation 42
Chaplin-Fulton Mfg. Co. 41
C. F. Braun & Co. 3
Copper & Brass Research Ass'n. 12
Fluor Construction Co. 36
General Gas Light Co. ..... Third Cover
Hammel Radiator Corp. 40
Ingersoll-Rand Company 9
E. A. Key Company 42
Lattimer-Stevens Co. ..... Fourth Cover
Llewellyn Iron Works 47
Los Angeles Biltmore 40
Merco Nordstrom Valve Co. 44
Metric Metal Works ..... Second Cover
Chas. C. Moore & Co. 42
Mueller Co. 7
W. E. Mushet Co. 45
National Meter Co. 38
Oliver Continuous Filter Co. 13
Pacific Foundry Co. 40
Pacific Gas Radiator Co. 35
Pacific Gas & Electric Co. 43
Pacific Meter Works 10
Pacific Tank and Pipe Co. 46
Pittsburgh Meter Co. 12
Potter Radiator Corporation 37
Reliance Manufacturing Co. 45
Reynolds Gas Regulator Co. 47
Safety Gas Main Stopper Co. 46
S. B. Sexton Stove Co. 34
Smith, Booth, Usher Co. 4
Southern Counties Gas Co. 8
Sprague Meter Company 44
Stauffer Chemical Co. 46
Steere Engineering Co. 11
Stockton Fire Brick Co. 48
United States Cast Iron Pipe and Foundry Co. 6
Western Gas 41
Westcott & Greis, Inc. 5
Western Pipe & Steel Co. 14
Western Sheet Metal Works 34



Humphrey Radiantfire No. 112, the COLONIAL, well adapted to homes of either Dutch Colonial or English Colonial Design.

The Field for the Humphrey Radiantfire *in Homes of Period Design*

AIDED by comparatively temperate climatic conditions throughout the Pacific Coast, the vogue for Period Architecture is a noteworthy feature of Western building activity.

Interesting and beautiful homes of authentic style-influence demand careful treatment of their interiors. A special Period Model in the Humphrey Radiantfire is designed for each period type of home. There is a wide range from which styles may be chosen to harmonize with almost any interior.

Thus Humphrey, in creating Radiantfire models which combine mechanical superiority and convenience with the old-world charm of authentic design, has opened up to progressive gas appliance dealers throughout the country a rich field for business—the field of Homes of Period Architectural Design.

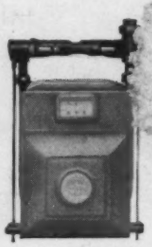
Manufactured by General Gas Light Company, Kalamazoo, Mich.

The HUMPHREY Radiantfire

TRADE MARK REG. U.S. PAT. OFF.

Pacific Coast Manager
C. B. Babcock
135 Bluxome Street
San Francisco

PROTECTION the Year 'Round



No. 2 overlapping bar type Lattimer-Stevens meter connection with meter shelf.

YEAR in and year out the lighthouse beacon gives assurance of safety to ships at sea. Likewise, Lattimer-Stevens meter connections give lasting protection against the leaks and losses that threaten resources invested in meter equipment.

Protection for the meter is provided just where it is needed—at the inlet and outlet piping. Lattimer-Stevens meter connections are simple in design and construction, adjustable to any alignment of meter columns and are fitted with the L-S patented shelf which supports th e meter and compensates washer shrinkage.

Sample and catalogue sent free upon request.

The Lattimer-Stevens Company

Columbus, Ohio

Lattimer Stevens

METER CONNECTIONS~SHELVES
STOP COCKS ~ ~ ~ AND SEALS

New England Representative
THE EASTERN SERVICE CO.
Boston, Mass.

San Francisco Representative
A. P. BARTLEY
San Francisco, Calif.